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The Electric Light.

LECTRIC light has been used in the British Isles principally for light-houses; but we are not aware that, beyond a few experiments, even a beginning has yet been made in its use for lighting up large open spaces or workshops, factories, and such like. The recent trials with the light made at the Mansion House,—which experiments are considered to have been on the whole successful, as might have been expected,—may therefore be said to fairly open up in this country the question of lighting public thoroughfares by those means. It may confidently be said that its introduction into factories and workshops will not long be delayed if once the electric light is accepted as a medium for lighting our thoroughfares. On the Continent they are very much ahead of us in this respect, especially as regards the employment of the new illuminator (which, by the way, cannot be everywhere utilised) in factories and workshops. In a recently published work, "L'Éclairage à l'Électricité," numerous instances of its use are given; we propose to cite some of them. The author, M. H. Fontaine, discusses its use in the various branches of industry, the requisite machines and lamps, the preparation of the charcoal points, the power required, and the cost. Those of our readers interested in the matter will do well to follow us.

Nothing known at present can take the place of the electric light wherever it is a question of being able to see or be seen at long distances; as in lighthouses, in fortresses, on board ships, on sea-coasts, or in the field during campaigns. The same is the case at works in the open air. Gas, petroleum, oil, are still to be preferred for lighting up dwelling-houses and low workrooms with their many small divisions, which have to be illuminated separately. In some cases, where now no nightwork can be done, it might be introduced if an illuminating power four to five times as strong could replace that at present in use.

There exist at the present time more than 300 applications of the Gramme machine for lighting, while about a year or two ago there were only twelve. The electric light was first used in engineering shops; next in dye-works, where a very white light is required; in sugar manufactories, where the steam, after its exit from the cylinders, is still further used for evaporation; also in railway stations; for building operations during night-time; finally, for spinning-mills, forges, foundries, &c. The electric lamp of Jablochkoff, although it will cause no revolution in the present mode of lighting, may be profitably employed in certain cases.

In the use of the electric light, in order to prevent dark shades, two lamps have to be set up. Each lamp burns from three and a half to four hours; fresh charcoal points must then be put in. This takes up only a few seconds, so that the extinction of the light does not give rise to much delay, especially if more than one lamp is employed. Whenever a continuous light is desired, two lamps are used, of which one ignites itself as soon as the other goes out. The light does not try the eye. Transparent balls were employed at first in workshops, but were found unnecessary, and removed at the desire of the workmen themselves. One great advantage in the use of the electric light is that the colours appear of the same hues as by daylight, a fact of great importance to dyers, spinners, painters, and others.

One lamp suffices for illuminating about 5,400 square mètres in an engineering workshop, half that space in dye-works or print-works, and four times that space on a wharf or quay, where no delicate work has to be performed. The cost of the lamp, the magneto-electric machine, the wires, &c., amounted in France altogether to 96*l.*

The electric light was introduced in the workshops of the Gramme Company in 1873. Only one lamp is used, and it replaces twenty-five gas-burners. It has worked well for four years, and the expense has been, including everything, not quite 6d. per hour. The room illuminated is 16 ft. 6 in. high, and about 40 ft. square.

In the works of M. Ducommun at Mülhausen, four lamps, each with a Gramme machine, have been in use for the last three years. The expenses of fitting up (400*l.*) are equal to that for 250 gas-burners; the light exceeds that of 400 burners. The lamps are 16 ft. 6 in. over the floor, and are distant from each other, as regards length, 69 ft., as regards width, 46 ft. Messrs. Heilmann & Steinlen have designed an especial communication of the steam-engine with the Gramme machine on the same foundation plate, which is very suitable for workshops and ships. The foundation plate, 7 ft. 4 in. long and 3 ft. 3 in. broad, is very heavy, so that all vibration is avoided. The fly-wheel of the steam-engine, of which one strap runs to the Gramme machine, makes 150 revolutions per minute, the Gramme machine, 850. The whole apparatus is sold in France for 160*l.*

The establishment of Lautter, Lemonnier, & Co., of Paris, in which lighting apparatus for lighthouses are made, consists of two rooms, each 98 ft. 6 in. long and 62 ft. broad; down the whole length of the workshops runs a gallery 33 ft. wide. On the ground floor the machinery and machine tools are placed; on the gallery the modellers and formers work. The three electric machines employed are in the machine-room, and make 850 to 900 revolutions per minute; each requires two elements, and supplies a light equal to 100 (Carcel) gas-burners. The charcoal points are consumed at the rate of about 70 millimètres per hour, their cost being 1s. 7d. per mètre, so that 100 Carcel burners cost about 1½d. per hour, besides the expense for the motors.

M. Menier's several factories comprise works at Grenelle (Paris) for manufacturing caoutchouc, sugar-boiling works at Roye, and a chocolate manufactory at Noisiel. In each of the two former, three machines, each of 150 burners, are placed, in the latter eight of them. M. H. Menier has made the lamp easily accessible, for the purpose of changing the charcoal, without ladders, by hanging them by a cable running over two rollers at the ceiling. The cable encloses a copper wire, surrounded by a coating of caoutchouc; over this, again, a wick-like layer of copper wire; then again a coating of caoutchouc; and, finally, a covering of hemp. At one end of the cable is a plate, supporting, on curved rods, the lamp; on the other end the cable runs round a drum of hard india-rubber, at both cast-iron cheeks of which the conducting wires are fixed. The lamp, when drawn up, is kept in its position by a catch on the drum. The eight machines of the chocolate factory at Noisiel are united in two batteries of four each, and are driven by water-wheels, the place of which, in case of necessity, may be taken by a special steam-engine. The wires lead to a commutator on the ground-floor, which permits the stream of each individual machine to be sent in fifteen different directions. Thus, each machine may be used for any lamp placed in a separate room; and in case a machine or a lamp should fail, others will take its place. This establishment of M. Menier is said to possess the most perfect method of lighting by electricity. Each lamp, hung in a square lantern at a height of 23 ft., lights up a court space of 21,529 square feet; two other lamps illuminate each an inner court of 5,382 square feet. The kiln-house, in which thirty-two workmen are engaged, of a length of 145 ft., a breadth of 36 ft., and a height of 25 ft., is lighted up by a single lamp, hung up at one end; the light is thrown by a parabolic reflector to the ceiling, whence it is equally distributed. In the forming and weighing-room ninety workpeople are employed; this room is 171 ft. long, and as broad and as high as the room last described. Two lamps are hung up 20 ft. high, and distant from each other 50 ft. The engineer's repairing-shop, of a surface of 4,306 square feet, is lighted up by a lamp placed 20 ft. high.

The Electric Light used in Spinning Mills.—In the spinning-mill of Dieu-Orby Veuve, at Daours (Somme), the work-room is 12 ft. high, 141 ft. long, and 36 ft. broad. It contains nine lapping-machines, with thirty spindles each, and seventeen twisting-frames with fifty-two spindles each; fifty men and women are engaged. Two

Gramme machines are driven by an hydraulic motor. The lamps hang about 7 ft. high, and are (as at Noisiel) provided with a reversed skylight, which throws the rays of light towards the ceiling, whence they are distributed in all directions, so that the glowing centres of light are not seen. Everywhere where there is a very white ceiling under 13 ft. high, it is better to employ the reflected light in preference to the direct. In the spinning-mills of Ricard Fils, at Mauresa (Barcelona), where the electric light is also used, the first floor is 108 ft. long, 70 ft. wide, and 13 ft. high. Two lamps are used for two self-actors. The two Gramme machines are placed at one end of the building, and are driven by the steam-engine of the works. The lamps are hung at a height of 11 ft.; they are placed 49 ft. from each other. In the second floor, the spinning-machines occupy a space 70 ft. long, 52 ft. broad, and 13 ft. high; one lamp suffices. The five self-actors work, like those of the first story, since May, 1876, every night. The owners of the mill are perfectly satisfied with the electric light. In the wool-spinning and weaving mills of Buxeda Frères in Sabadell (Spain), the room is 177 ft. long, 72 ft. broad, contains thirteen spinning-frames, twelve carding-machines, one butting-machine, and several other auxiliary machines; eighty workmen are employed. Formerly, when lighted with gas, some work could not be done at night, on account of the change in colour. At present three lamps, hung at a height of 13 ft., and 42 ft. apart, are used; and the mills work night and day, notwithstanding the dark colours of the yarn. The lighting is now cheaper than with either gas or petroleum.

The goods station of the Chemin de Fer du Nord, at La Chapelle at Paris, is now also lighted by electric light. The hall illuminated has a length of 230 ft., a breadth of 82 ft., and a height to the top of 26 ft.; a court 65 ft. broad separates the hall from a carriage-shed, which is 230 ft. long, 49 ft. broad, and 26 ft. high. The hall is lighted by two lamps, fixed in lanterns placed 15 ft. high; the glass of the lower parts of which is painted white, to protect the eye. It is stated that a saving of 25 per cent. is effected in the number of workmen employed at night. One lamp suffices for the court and the carriage-shed. The machine is placed about 283 ft. from the lamps. The expenses per hour for each lamp amount to about 7d. The cost of fitting up, including the steam-engine, is stated at 920*l.*

The harbour works at Havre for enlarging the outer harbour could be carried on only during low water. Two electric lamps, each of a lighting power of 500 Carcel burners, enabled 150 workmen, distributed over a space of a little over three-quarters of an acre, to work as during day.

In the iron pipe foundry of Mignon, Rouart, & Delinière, of Montluçon, two Gramme machines light a room 207 ft. long, and 112 ft. broad, by means of two lamps hanging at a height of 20 ft., and at a distance of 103 ft. from each other. The shadows thrown by the workmen on the machines are so little noticed that it is possible to read even in places where they are darkest. A second room, next to the first one, and separated from it by a wall with broad niches, receives light enough to enable persons to read in it everywhere, although some spots are distant 279 ft. from the lamps.

In a port belonging to a sugar refinery on the Rhine-Marne Canal at Sermaize, the electric light has been used since the end of 1875 for lighting up a wharf used for unloading beet-roots. A Gramme machine of 200-candle power is placed near the steam-engines, 230 ft. from the lamp. Two ships are very often unloading at the same time. The saving effected per hour is at least 8s. In sugar refineries the expense of lighting by electricity is almost confined to the cost of the charcoal points, for the steam required for driving the machine may be further utilised.

In a skating-rink at Vienna, near the Park-ring, with a skating surface of nearly an acre and a half, two Gramme machines, driven by a No. 8 engine, and placed 443 ft. from the rink, illuminate easily a space of a length of 436 ft. (including the promenade) and a breadth of 187 ft. The Serrin lamps are placed in the upper parts of two turrets of pine, 25 ft. high, and 187 ft. distant from each other. To prevent the light being thrown upwards, two reflectors are so placed as to reflect all the light on to the skating-ground. The eight sectors of the reflector are curved in an ellipse, one focus of which is the lamp, while the other lies 3 ft. lower.

To the above information may be added a few details from a report addressed by M. Ch. Rousseau to the Société Industrielle d'Amiens.

The oldest and best known electrical lighting apparatus, founded on Clark's principle, employed by the Alliance Company, is used in various French lighthouses. The more powerful and smaller machine of Wilde has been selected for the Scottish lighthouses.

The Gramme machine is used in Daour's foundry, Amiens. The room in which it is employed, of a surface of 5,167 square feet, is nearly four times as long as it is broad (144 ft. by 36 ft.) and 13 ft. high. It is lighted by two Gramme machines by means of two Serrin lamps, which are placed 40 ft. from the ends of the room and 7 ft. 6 in. above the floor. At first the lamps were protected by dull glass; the intensity of the light, however, was still too much for the eyes of the workmen, and the room near the lamps much lighter than at its ends. The work had to be suspended when one of those glass globes broke. M. Ernest Dieu then had the happy idea of replacing the dull glass by metal reflectors fixed underneath the lamps, which threw the light on to the ceiling. The sources of the light are thus nowhere seen in the room. The motive power is supplied by a very powerful water-wheel. The expenses for fitting up the electric light were:—

Two Gramme machines	£152	0	0
Conducting wires	6	14	0
Mounting of the cylinders, &c.	19	2	0
Straps	7	0	0
Erecting the lamps	2	0	0
Total	£186	16	0
Consequently interest and amortisation	£24	0	0

With steam-power by means of a small machine 8*l.* would have been used for 10 tons of coal. The charcoal points cost for 500 hours 7*l.* 12s. Reckoning 8s. for extras, 40*l.* would be the yearly expense, or 1s. 7¼d. per hour. Fifty-five gas-burners would in Amiens each consume 2s. 2½d. worth of gas, to which would have to be added 4d. for each for interest and amortisation of capital sunk (60*l.*), besides the cost of maintenance.

In the Gare du Chemin de Fer du Nord, at Paris, the extinction of the light has been prevented by setting up a reserve lamp. The lamps are placed on tables, which are long enough to permit of a fresh lamp being put on them, while the one to be changed need not be taken away until the new one is in operation.

In the recent trials at the Mansion House the light was obtained from a Bunsen 48-cell battery, and its effect was so powerful on the populous thoroughfare as to make the numerous vehicles and foot-passengers as conspicuous as in broad daylight. The lamps were protected by opal glasses, to tone down the dazzling effect of the light. It is proposed at present to illuminate only the Thames bridges and the open spaces of the City with the new light. The statement that its cost, after the erection of the necessary machinery, will be about the same as that for gas, seems to us erroneous, unless the City of London is going to pay at a much higher rate for the new light than that at which it is produced on the Continent, as appears from what has been stated above. The instances we have cited show that the expenses for the electric light are very considerably below the price of gas; unless the statements be explained by the fact that gas is charged much higher on the Continent than it is in this country.

The Property Market.—The total sales for the year reported up to the 30th of April, inclusive of sales by private contract, amount to 2,149,795*l.* This is no less than a million below the sales during the same period of last year, and about the same amount as 1876. Business is dull, and will continue to be so till after the question of peace or war is settled. Messrs. Farebrother, Ellis, & Co. sold, on the 4th, a nice little estate of 53 acres, with residence, in the Isle of Wight. It fetched 7,000*l.*,—about 150*l.* per acre,—cheap, we should think, at the price. Messrs. Newbon & Harding sold freehold ground-rents, amounting to 621*l.* per annum, at Holloway, for 16,010*l.*,—over twenty-five years' purchase. Messrs. Hards, Vaughan, & Co. sold, on the 5th, ground-rents at East Dulwich, amounting to 144*l.*, for 3,065*l.*, about twenty-two years' purchase.—*Metropolitan.*

NOTES ON ARCHITECTURE AT THE ROYAL ACADEMY.

CONTINUING our notes in the architectural room,* the next work of importance is that numbered 1092, "New Banking Premises for Messrs. Child & Co., Temple Bar," John Gibson. The style in which the building is designed, Roman with "engaged" columns, has been so all but universally accepted as the bank style in this country, that only an exceptionally bold architect would venture to depart from it. The drawing is a large and rather mechanical draughtsman's production: it is needless to say that Mr. Gibson has carried out the style with knowledge and good taste. It may be time, however, for some new architectural expression of banking to be evolved.

1093. "South-west View of Mansion at Lytchett Heath, Dorset," David Brandon. This and No. 1081 illustrate two mansions by this architect, both in Elizabethan style and preserving the recognised features of the style intact; they will probably look more noticeable in execution than they do in these drawings.

1095. "Design for the Completion of the Belfry, Christ Church, Oxford," G. F. Bodley & T. Garner. A very fine powerful water-colour drawing showing a corner of the "quad," with the massive square tower, and on it an open-work lantern of very elaborate late Gothic design, terminating in a cupola roof. It is not made sufficiently obvious what is the material of the proposed lantern: it looks most like iron from the way it is coloured, but is certainly too heavy in parts for that, while it is too light for stone, which the tinting also contradicts: wood seems the only alternative: this should have been made clearer, but the drawing as it stands is very effective.

1094. "Yattendon, near Newbury," A. Waterhouse, A. This is a much more effective and original building than "Iwerne Minster"; the treatment of the upper portion of the large heavy tower has considerable novelty, and is very pleasing in result.

1100. "Design for Town Hall, Barrow-in-Furness: Second Premium," T. E. Collcutt. The Barrow folk were fortunate in their competition if the selected design is superior to this; it is rather a medley of Classic, Gothic, and Queen Anne detail, certainly, but that is what we seem to be coming to, and the architect has contrived to give considerable unity of effect, after all. The objections are that the dormers are somewhat heavy to come over the arcaded story below them, and that the junction of the octagon lantern with the square tower is not well managed, and the broach angles are filled up with objects that seem actually intended to imitate "pepper-boxes." There is a separate drawing of the tower exhibited (1130), which, however, does not reconcile us to this defect. The design owes something to the fine drawing; but there is much force and originality in it in spite of the defects named.

1104. "Reredos, St. Martin's Church, Brighton," H. Ellis Wooldridge. A large coloured elevation, occupying the centre position on the wall, a position which it seems to merit rather for its size and elaboration as a drawing than from any remarkable qualities as a design, so far as the architectural portion is concerned, at least. It is a large built-up composition in florid late Gothic style, entirely gilt, which would have a somewhat tawdry, rather than a rich effect; the spaces between the architectural constructive portions are filled with fresco paintings, which in the drawing are too small, and too far from the eye to be judged minutely; the general result is certainly rather too *prononcé.*

1103. "Houses now building in Cadogan-square," R. N. Shaw, R.A. elect. A fine drawing, like all Mr. Shaw's drawings, and a singular medley in regard to design. The square projecting bay in the centre of the front requires three ponderous stone brackets to carry it; the equally projecting octagon bay at the angle stands upon a glass window. There is eccentric—one may say piquant—effect in this, but all principle or logic of design seems ignored.

1106. "Selected Design for proposed Municipal and School Board Offices, Leeds," Geo. Corson. We mention the presence of the drawing here; the design we commented upon fully at the time of the competition, and gave an engraving of it subsequently.

1109. "Central Hall of new Natural History Museum," A. Waterhouse. An elaborate

* See p. 480, *ante.*

coloured drawing of an interior in which terra-cotta work and constructive polychromy are largely used, and in which the style may be said to be founded on Romanesque, with a modern treatment suitable to the material employed. The hall is roofed with iron principals, which spring from vaulting-shafts carried up from the floors; between the piers the lower story has an arcade of rather low-proportioned round arches, with no imposts, and the archivolts decorated with terra-cotta ornament; above, the bay is filled with triplets of arches on shafts, the centre arch carried up with a very high stilt, after the Byzantine manner. This latter feature strikes us as an awkward feature which it is a pity needlessly to revive; in many respects the interest and originality of the design cannot be disputed. The effect of the junction of the iron roof with the masonry would have been more satisfactory, perhaps, if more mass could have been given to the iron principal at its springing; as it is, there is too marked a contrast between the massive character of the masonry design and the thin web of the iron rib.

1108. "Westwood House, Sydenham: a Remodelling of the Exterior without any material Alteration of its present Plan," J. L. Pearson. A very rich and effective design of Late Elizabethan type. An original feature is the manner in which the reversed convex and concave gables characteristic of the style are filled with ornament in relief, apparently modelled in plaster, but as the drawing is not coloured, the material here can only be guessed at.

1115. 'Design submitted in Competition for the Kensington Vestry Hall," J. M. Brydon. An elevation of a Queen Anne design with a great deal of merit, which we noticed with commendation when the competition drawings were exhibited.

1116. "Great Central Schools, Public Offices, and Firth College, Sheffield," E. R. Robson and T. J. Flocton. A group of educational buildings on an irregularly-shaped piece of ground, as appears by the small plan which the authors append (we wish all contributors to the architectural room would do the same); but the perspective is rather unscrupulously "cooked," so as to have the effect of a right angle instead of an acute angle, with the object of showing both fronts, which would be impossible from this point of view if the true shape of the plan were adhered to. The parroting of the manner of building of a century back could hardly be carried further, or done more completely, than in this building, with its curved buttresses and scrolls, and its heavy blank niches in the end wall of the schoolhouse. The only interest of the design appears to us to lie in its success as a revival; it is certainly not beautiful. The drawing is a very refined and artistic one, drawn and shaded delicately with a pen, in brown ink.

1107. "House at Woburn Park, Surrey," F. Allen. A design showing a good deal of originality in a quiet way; an old English type is suggested, but not implicitly copied.

1114. The interior view of the Catholic Cathedral at Queenstown, by Pugin and Ashlin, the exterior of which was noticed in our last. The capitals of the round piers of the main arcade are a little too florid and "cabbagy" in appearance; but otherwise it is a fine Gothic interior. The panelled roof is carried by heavy solid principals, which are very well connected in design with the substructure. A section of the wall is given on the plane of the picture. We note with approval every attempt thus to combine (at least) geometrical drawing with picture-making, as that is what we want to see more of.

1117. "School Buildings, Woburn Park," A Dunn and E. J. Hansom. A large expanse of red brick Tudor buildings pleasingly and correctly treated. The large wooden bargeboards to two gables in one corner look rather like intruders, unless they are meant to specialise that particular portion in some way.

1120. "New Church for the Welsh Calvinistic Methodists, Cardiff," H. C. Harris. At this rate of progress in ecclesiastical architecture the Welsh Calvinists will surely hardly know themselves soon. The building is in an early style of more or less Frenchified Gothic, and is apparently inspired by the style of a well-known architect of French Gothic tendencies who has done a good deal of work at Cardiff. It deserves all praise for the solidity and true feeling for Gothic displayed in the treatment of the style.

1122. "Falcon Tower, Surrey," E. A. Heffer. A large house of domestic Gothic type, showing a good deal of character and originality in the treatment of the heavy half-timbered gables.

1123. "Offices and Residence for the Chartered Mercantile Bank of India, London, and China, Shanghai," Wm. Kidner. A very suggestive title. What an opportunity for connecting the architectural expression of the building with all the three countries it represents, by blending or mingling details or ornament of those nationalities! The architect has not yielded to the temptation; he has made a Classic building with very narrow and tall engaged pilasters running in strips up the face. However, the necessities of the climate, in demanding a shadow recess in front of the windows, necessarily give the cue for some original treatment, and the author has availed himself of this very well, especially in the upper story, where the small square coupled columns thrown out by the deep shadow of the balcony or verandah behind (only "verandah" is always applied to a ground-floor, we believe), have a very pretty effect: also the treatment of the frieze and cornice with large double brackets rising over the columns before mentioned, and a kind of grid-iron between them in the frieze, whether for ornament or for some utilitarian purpose of providing ventilation, is not quite apparent.

1121. "Design for St. Michael's Church, Northampton," A. W. N. Burder. Noticeable for its solidity of character and a certain originality in the treatment of the centre octagon.

1124. "Offices to be erected in the Grey Friars, Leicester," Isaac Barradale. Very pretty indeed: Domestic Gothic, with long mullioned windows built out as bays, thus getting a side light at the end of the desks, if we suppose the desks to be in the windows. At all events, this would be a useful point in the arrangement of the windows for some kinds of work; and the building is not so merely imitation old style as many of its class.

1126. "House in the Grounds of the Paris Exhibition," T. E. Collcutt. We have had to praise Mr. Collcutt more than once in the course of our notes, but verily in this we praise him not. We hope the Parisian public will not take this as a sample of what we are able to do in Domestic architecture.

1125. "New Buildings, Salisbury-court, Fleet-street," A. Peebles. A resuscitation of old London building, with solid brick piers and bay windows between, set back from the line of frontage. An imitation of previous efforts in the City which have led the way to this kind of thing; and, on the whole, not behind its models.

1131. "Manchester Town Hall, Albert-square Entrance (A. Waterhouse, A.R.A., architect)," T. Raffles Davison. A small pen drawing, remarkable for the beauty and finish of the draughtsmanship. Is the arch of the entrance really horse-shoe form, drawing inwards at the springing? It is made to seem so here, slightly, but unmistakeably.

1132. "Proposed Morning Chapel, Church of the Annunciation, Chislehurst, Kent," Jas. Brooks. Looks like a careful drawing of a good piece of thirteenth-century English Gothic; which, we suppose, is the object aimed at.

1113. "St. John the Evangelist, Red Lion-square," J. L. Pearson, A. Here is some original treatment of Gothic, at all events, and in a very fine way. The mass of the church is red brick, but the spire is of stone, and so also are the heavy spirelets crowning the turrets which flank the chancel. The upper stage of these turrets wants scale and force to carry the weight of the solid-looking stone roofs over them; otherwise everything in the building is in keeping. The outline is varied and picturesque, but the author appreciates thoroughly the value of a solid base of nearly unbroken wall as a foundation for the picturesque of "skyline."

1140. "Dining-room, No. 52, Prince's Gate," Geo. Aitchison. The only drawing of Mr. Aitchison's exhibited this year, and one which would not in itself give a full idea of his abilities as a decorative architect, though it is in irreproachable taste as far as it goes. The fireplace is surmounted by a quasi-architectural design in dark wood, of completely Classic type, and with paintings in the panels; low bookcases carried along the wall in the same style. The design of the wall-paper seems a little over-large, and too straggling in its principal lines.

1142. "Designs for a Series of Painted Glass Windows on the Staircase of the Conservative Club, Manchester," E. Frampton. Very good specimens of stained-glass design. Three single-light windows are shown, each with an allegorical figure, much better drawn than figures in stained glass generally are, and with good colour.

1147. "Galleries, No. 39B, Old Bond-street," E. Salomons and R. S. Wornum. The galleries built for Messrs. Agnew, which have attracted the notice of passers-by in Old Bond-street recently. A red brick Queen Anne front, very completely carried out.

1154. "Study for Ceiling Decoration," G. E. Fox. A clever coloured drawing, but a design unsuitable for ceiling decoration, as it includes quasi-architectural niches and figures standing in them, their heads pointing in different directions over the ceiling, a kind of design totally unsuitable for painting on a ceiling, where there is no "right way up," to enable us to decide whether to regard the figures as standing on their heads or their feet.

1162. "The Domestic Chapel, Mooresfort," G. C. Ashlin. A very good drawing of an interior, apparently modern, but in that case an exact and literal reproduction of the most characteristic details of early Transitional work,—double zigzags, &c. The treatment of the wooden wagon-vault with heavy ribs is good, and is the only portion with any claim to originality.

1164. "New Buildings, Paternoster-square, City," A. M. Ridge. The effect of the open arches, with galleries in the gables, is very good. This is in danger, however, of becoming a commonplace. It has been found such a good means of producing effect in a street-front that a great many architects seem to be adopting it as a feature in their city designs.

1163. "Design for a Convalescent Hospital," P. J. Marvin. Why did not the author give a plan? It is utterly impossible to speak of a hospital design on the basis of a perspective view only; it may be fit, or it may not. We only notice it here as a pretty drawing.

1167. "Decoration, Great Library Ceiling, Eastnor Castle," G. E. Fox. Not very pleasing in colour, but much more suitable for a ceiling design than the other drawing, by the same hand, mentioned above.

1168. "Decoration to Dining-room," Cole A. Adams. Rather strong tones, green and red, well combined in the dado, with a light and delicate wall diaper over; the frieze is carried out in the same key as the diaper, with some originality of detail.

1171. "View of Entrance, New House, Eastbourne," R. W. Edis. Looks much more like a good sketch of an old house; and whether that be regarded as a complimentary criticism or the reverse, depends upon a good many considerations.

1173. "New Bank erecting at Salisbury," H. Hall. An agreeable addition to the not very interesting street architecture of Salisbury.

1174. "Proposed Addition to Queen Elizabeth's Grammar School, Cranbrook," W. West Neve. It is not obvious which is addition and which is original. The whole is a pretty drawing of a remarkably picturesque old English building of rural type.

One cannot but feel the exceedingly unpractical nature of such an architectural exhibition as this. There is a great deal of good, very good, drawing, mostly expended on what is pure "scenery,"—the getting up of architectural masks of a more or less antiquated character. Hardly a drawing in the room shows plan or section; the outside of the buildings we can see, but their suitability for their purpose, and the relation between their plan and construction and the external design, we learn nothing of for the most part. Almost the only drawings which really can be judged of on their own merits are the coloured drawings of decorative design, which are very few, and of which only three or four can be said to be very good. The fashionable drawings of decorative schemes in pen-shading are little more than waste paper. The getting up of such things is merely a matter of the sleight-of-hand of a draughtsman; with a due amount of work put on the shading and touching up they can always be made to look effective, and the trick once learned is easily repeated to any extent. It is, therefore, the department of coloured decorative work which it seems really most worth while to develop in the architectural room of the Academy, as the only class of design which really can be adequately represented in this room, and which, moreover, painters, and perhaps the outside public also, are the most likely to feel interested in. It is possible that the Academy would not encourage the multiplica-

tion of plans, sections, and constructive drawings in the architectural room, as tending too much in the direction of science rather than art. Yet any full consideration of the subject ought to show that it is only on this basis that architectural design can be a reality or can be properly judged of. The tendency to fill the room with pretty drawings has had its effect more or less on the public, and the architectural room is not quite such a desert as it used to be; but though no doubt it may be good for the architects that their pretty drawings of Queen Anne houses, &c., should be seen by visitors who may thereby be incited to be clients, the educational effect on the lay mind can only be injurious, as tending to confirm them in that merely dilettante skin-deep view of architecture, as the art of copying old buildings, which is as widespread as ever. As to architects *learning* anything from the architectural room, no one, we suppose, ever thinks much of that. But if the objects of the Royal Academy Exhibition would be at variance with the more practical and constructive architectural display which would be of real value, it is much to be regretted that we cannot have an architectural exhibition which would show the practical basis as well as the outward results of architecture. The difficulty, of course, is (as it was found to be before) that the public do not care for such an exhibition, and therefore it cannot be made self-supporting. It might meet with better success than before, however, if the element of decorative design were more emphasised and made a leading feature, in combination with the constructive design.

As matters stand at the Royal Academy, we can only hope that in future architects who send works for exhibition will make more a point of at least including, in a kind of marginal way, some of the practical details of the buildings illustrated, and not be so generally content with merely making pictures of buildings mostly in imitation of something else. And we strongly recommend a more extended development of decorative design, as the portion of architecture most purely artistic, most nearly allied to painting, most capable of being illustrated in drawing, and certainly most likely to render the architectural room attractive. Perspective views of buildings are but bald things, except in cases where there is an opportunity for realising something like the highest capabilities of architectural grandeur; but decorative design is a most attractive branch of art to most people who care for art at all, and its adequate representation in the architectural room might go far to make "Gallery IX." compete fairly with the other rooms in securing public interest, which it certainly does not at present.

OUR IRON INDUSTRIES.

OUR iron industries are becoming more and more the controlling trades of very great districts of Great Britain,—not only extending the trading bounds of those districts very greatly, but also forcing on an immense development of other and allied industries. It is not too much to assert that the application of discoveries of ironstone frequently changes not only the character, but even the physical appearance of whole districts; and there is full exemplification of the truth of this statement in the marvellous changes that have taken place in the course of less than two score years in the iron-producing districts of the north-east and the north-west,—the Cleveland and Furness tracts of country respectively. It is by the application of such discoveries, and by the improved methods of smelting and working the produce of the mines, that in the course of a century we have not only ceased to depend upon other countries for our supplies of iron, but we have built up a very large export trade in iron in all the branches of that wonderful industry. From the many mines in the kingdom we now yearly draw close upon seventeen million tons of iron ore, worth a sum approaching 7,000,000*l.*; we have over 930 blast furnaces erected,—a costly smelting-plant which represents a capital of probably over 15,000,000*l.*; and of finishing ironworks, we have 312 enumerated in the mineral statistics, which in times of normal value would represent a capital of 7,000,000*l.* addition; so that whether we measure the trade by its extent, by its influence upon tracts of country, or on allied trades, or by the capital which may be assumed to be invested in it, it is in every way worth more general knowledge than obtains in regard to it. We have three sources of our iron supply,—that is to say, that the many kinds of ironstone may be roughly divided into three. First, those found in the coal measures; then, those found in the lias of Cleveland, and the oolitic ores of Lincoln, Northampton, and other counties; and lastly, the hematite ores, such as those of the Furness and West Cumbrian districts. Of late, the old materials for the supply of the blast-furnaces,—those deposited in the coal measures,—have grown scarcer, and there has been an increased resort to the second class, whilst the third have also grown largely. Out of our 16,841,000 tons of iron ore, considerably more than a third are derived from the comparatively new iron-producing district of Cleveland, and this vast iron-making centre, which has been styled a new Golconda, may be taken as a type of the whole of the iron-making districts of the kingdom.

Down to thirty years ago, it was merely a sparsely-cultivated and thinly-peopled district, untraversed by railways, and out of the track of commerce. A few small towns carried on older industries, and a few villages and hamlets found subsistence for their inhabitants by fishing, if on the coast, and by agricultural pursuits if in the interior. The opening of a railway from Pickering to the small port of Whitby disclosed the existence of workable beds of ironstone, which were brought into requisition to supply the needs of Northern furnaces; and as the latter grew, increased, and at length successful search was made for the seams of ironstone in the northern part of Cleveland. Since that success, there has grown up a trade which, for extent, has no compeer in the records of metallurgy. The whole district has been given up to the trade in its many forms. The Northern spur of hills, the valleys, and near the coast have been almost honeycombed in the gratified search for iron ore; and now, from nearly forty mines, from 6,250,000 tons to 6,500,000 tons of iron ore are annually extracted in quantities varying from a thousand to over half-a-million tons respectively. In the last year for which official statistics are procurable, the value of this ironstone was estimated at 1,162,020*l.*, the basis of the calculation being an estimation of its value at the mines at from 36s. 4d. to 36s. 9d. per ton. This use of the argillaceous carbonate treasures of the North Riding of Yorkshire has changed the appearance of its north-eastern portion, scattering prosperous little mining hamlets and villages on the once bleak moors in the pleasant little dales, and drawing to it a population from near and far to supply the ever-increasing needs of the blast furnaces. And from the commencement of the smelting of this iron ore down to the present there have been erected in and on the borders of Cleveland 126 blast-furnaces, which now produce over 2,000,000 tons of crude iron annually. Nor is this production of pig-iron (worth, at the lowest computation, 4,000,000*l.* sterling annually) the only token of the growth of that great primal industry of Cleveland; for it has allowed of the building up of an export trade of very large dimensions; and it and the finishing iron trade have caused the upgrowth of towns of very large population, which are far from having attained their maximum growth. As to the finishing iron trade, it may be said that in the district of Cleveland proper there are twenty-six rolling-mills, and in the adjoining district eighty more, the productive capacity of which is indicated by the fact that there are over 2,100 puddling-furnaces in connexion with them, with auxiliary appliances in full corresponding number. There has been, moreover, a full development of allied trades,—foundries, iron shipbuilding-yards, and similar establishments, which almost invariably follow the upgrowth of the manufactured iron trade. The face of the country has been changed by this great industrial uprisal. All the mining district is now a well-peopled region; and if by hundreds miners and their families have been brought thereto, there have been thousands of ironworkers and others brought to the towns. Not only have old towns, such as Darlington and Stockton, been greatly added to by the development of branches of the iron trade in their midst, but, in addition, newer towns have become centres of the manufacture, and have risen surprisingly with it. Middlesbrough, from one of the smallest of the coal-shipping towns on the north-east coast, has grown until its population is computed at over 50,000, and there are half a dozen towns in embryo near it. The whole of Cleveland has, in fact, been built on iron, and the foundations of its greatness are on the same base. Its presence is all-pervading. It is observable in the mining district in the shape of the gridironing of the land with railways to and from the mines, and the "cradles," ventilators, and other machinery near the mine mouth; it shows itself on and near Teeside, in the miles of slag from the furnaces, and in those dark indices to prosperity, often flame-crested, and frequently sending out streams of white-hot iron; and it is most powerfully portrayed in the rolling-mills, in which now and again the yawning mouth of the puddling-furnace displays a vast space white-hot, and sending forth fierce rays; whilst more frequently, through an aperture, an even intenser heat pains the eye, and throws out hot emanations. The ear attests the presence of the sons of Vulcan in the rattle of the barrows, with their supplies of ore and fuel, and the creak of the "slide" at the blast-furnaces, with the hissing of steam and the shunting of many trucks; in the rolling-mills, by the scraping of the "paddle" in the furnaces, the strong thud of the steam-hammer, and the beat of the rolls, as the hot bar passes through them; and in the clinking of the riveters' hammers in the shipyards.

The great industry thus typified is subject specially to ebbs and flows, and this is proved to the full by the recent history of the Cleveland district. In the times of prosperity which set in some seven or eight years ago, there was known an intense demand for iron goods, which taxed the producing capacities of most iron-yielding districts. New mines were opened out, new furnaces built, and new rolling-mills erected; but before these were all fully productive, the intensity of the demand had passed away, and the markets became glutted with iron goods, whilst the prices began to fall rapidly, and demand followed its usual course in retreating from a falling market. A change became observable also in the nature of the diminished demand which very materially affected the condition of Cleveland; the durability and longer "life" of steel rails had been proved to demonstration on railways, and the increased facilities of supply by the extension of Bessemer steel works enabled the price to be brought so near to them for iron rails that the demand for the latter fell off from one of great extent to one of mere nominal dimensions. In the Cleveland district, the production of iron rails had formed one of the largest branches of the manufactured iron trade, and as steel rails were not produced on any scale of magnitude in the district, the result of the change was at the time practically, if gradually, to close the iron-rail mills, and to depress all other branches of the iron industries as well as the allied trades. Thus, one by one rail-mills were laid idle, and the blast furnaces which had supplied them with nearly half a million tons of crude iron, felt the loss of the demand, and after storing their production for a time, were compelled to cease work, for the same depression had in some degree affected other districts consuming the cheap pig iron of Cleveland. And now, probably, the lowest range in production and prices has been reached in consequence of this cause; for only 95 out of the 164 blast furnaces in the North are at work, and only about one-half of the 2,000 puddling furnaces are now productive, whilst the price of pig-iron is only a third of what it was four or five years ago, and that of manufactured iron is only about one-half. The manufacture of steel rails has been introduced into the district, and the use of imported ores is now on a large scale; for the presence of phosphorus and other vitiating elements in the Cleveland ironstone has hitherto prevented the manufacture of steel from it. At the same time, attempts are being made to render it fit for this, and as the ores of iron in Britain capable of being smelted and used for the steel manufacture are small comparatively, the solution of this metallurgical problem is one of the needs of Britain. The great change which has been known in the rail manufacture is being carried out in other branches of the iron industries, and it is impending in still more, so that the growing demand for ironstone is one needing an extension of the fields from which it is at present supplied. But whilst that problem remains unsolved, our iron industries are checked in their growth, more especially those situated as are those in Cleveland, and the check is rendered sharper by its occurrence at a period before they had begun to recover from the depth of depression into which they were plunged by the reaction after

the period of abnormal trading prosperity and intense demand. The lowest depths in the descent have now been reached, and as the period of the lowest ebb of the tide precedes its rise, so in the iron industries it is to be expected that the flow cannot now be far off commencement. As the incidence of the depression has been unequally felt in the various districts, owing to their unequal dependence upon the branches chiefly affected, so the effect of the probable increase in the trade will be unequally known and distributed. But looking to the long reign of dulness, and to the previous history of our iron industries, it may be expected that the commencement of an improvement cannot now be much longer deferred, and the first to benefit by it will be those districts which, in the years of dulness, have prepared themselves to meet an increased demand in the changed form in which it will declare itself.

THE FURNITURE EXHIBITION.

A SIGNAL interest, no doubt, attaches to the Furniture Exhibition at Bethnal-green, and the lights thrown upon it by the introduction to the catalogue, and the catalogue itself, are useful to the general visitor. As an illustrative collection the display is sufficiently large and varied. It begins earlier than the commencement of the sixteenth century, and stops short of modern upholstery. There are casts, or copies, of those unique magisterial chairs, in bronze, which were discovered at Pompeii, and are preserved in the National Museum at Naples, each being a work of art indicating a high state of luxury. The throne of Dagobert is also in model, from the original, in the Louvre; but it is nothing better than a barbarous restoration, after all; for no one pretends that this is, in its integrity, the royal seat of the Frankish king. The other groups of chairs, principally in oak and chestnut, and belonging to different—and much later—periods, are chiefly remarkable on account of the lines of advance they show in the craft of carving, the Italian and Venetian being especially remarkable on this account, though many of the English, French, and German examples are well worth studying by the modern designer and artisan. Judged from a comparative point of view, it cannot be said that the English cabinet-work excels. With reference to the Indian and Japanese specimens, they are, of course, only curiosities, as, indeed, are those from Portugal and Holland, at a time when the art of furniture was scarcely understood in Europe. The Chippendale specimens are more important, as marking at once a change in fashion and a progress of industry; and to Thomas Chippendale, indeed, we owe a multitude of modern comforts; for it is difficult to imagine how our forefathers could have sat at those olden tables, on those olden chairs or stools, or knelt upon those high-backed prayer-chairs. It may be worth while, however, to ask what lessons those old makers left to their posterity. It is curious to find, among the earliest developments, that of Switzerland, whose cabinets, in sculptured wood, vied with the best of English fabrication, —imitated from Venice,—in the latest years of the fifteenth century. No doubt the taste of that age, in both countries, as in others, was a near approach to the grotesque. There were side-boards, as they would now be termed, composed of vase-shaped forms, piled one on the top of another, with Roman friezes between; and there were tables, the legs of which were masses of statuary in wood, of enormous solidity and weight; but the idea that they could never have been moved from spot to spot, in a baronial hall, is disposed of by the fact that they were obviously, from signs still existing, supplied with castors to roll upon. But it would be a mistake to infer that this heaviness of composition was all-prevailing, or that Dr. Johnson was right when he declared that all the old furniture-makers used oak as their material. The famous little "Hill" table, with its medallions of beautiful faces, is of cedar, and with its graceful lines of foliage, appears to grow out of the ground. There is no example of this class, so far as we have examined the collection at Bethnal-green, but it is one extremely characteristic, and worth attention.

The bedstead is an article of furniture upon which have been lavished the utmost ingenuity, and even genius, of artists belonging to this order, in all times, and among all humanised nations. It is, upon the whole, only fragmentarily represented at Bethnal-green; but a collection, even of copies, would be exceedingly interesting. The bedsteads of the ancients took the form rather of couches,—still affected by the French,—rather than of that which we understand by the term,—a fashion that reached its height in the sixteenth century, when "architects" were employed to design these "commodities of comfort" for royal palaces. The first Francis of France would be content with nothing less than a drapery of curtains upheld by Corinthian columns, deeply grooved, of sandal-wood, and the ladies of his court reposed beneath cloister-like vaults of chestnut, surmounted by crowns. Still, a bedstead is not a very appropriate subject of art, — far less so, at any rate, than a cabinet. Now, of cabinets, or *armoires*, in the modern sense of the expression, the ancients knew nothing,—they used, instead, as did the Mediæval Venetians and Germans, huge coffers, upon the sides and lids, and sometimes even in the interiors of which, the fancy of the wood-carver at once exercised and exhausted itself. The *armoire*, or cabinet, was a production of the Renaissance, when its adoption became a rage with both the nobility and the wealthier middle-classes, all over Europe. One of the earliest and noblest specimens is preserved in the Hôtel de Cluny in Paris, illustrating the story of Ganymede. All this work, indeed, attributable to that period, is characterised by almost an excess of richness, governed, however, by a noble taste and great picturesque powers of imagination. The variety of creation, in shape and ornament, in that great furniture age,—preceding the barbarisms of the younger French style,—was little less than miraculous, and the same genius which designed the façades of Blois, of Anet, and of Fontainebleau, was devoted to the elaboration of a table or the carving of a side-board. The same artist, indeed, often helped to build a palace, and to furnish it. Jean Goujon sculptured the doors of Saint Maclou de Rouen; Germain Pilon wrought the cedar arabesques for the altar of the Celestines at Paris; and Benvenuto Cellini did not disdain to carve a wooden salt-cellar.

With the increase of wealth came an increase, naturally, in the luxury of furniture. We see this fact of history illustrated, though in a vague and desultory manner, at the Bethnal-green Museum. Under Catherine de Medicis, the comparatively rude sideboards, for example, which had satisfied the subjects of the First Francis, were condemned as too simple and barbaric, and for them were substituted immense *armoires*, profusely carved, of oak, walnut, and ebony, then first called "cabinets," containing multitudes of compartments and drawers, and furnished, as a rule, with double doors, the interiors of which, as they were more frequently open than shut, were enriched with incrustations of tortoise-shell, copper, polished tin, marble, precious stones, and Florentine mosaics. Those were golden days for the cabinet-making craft. But the spirit of change never slept. The innovations of that fantastic artist, Wendel Dietterlin, towards the close of the sixteenth century, brought about an unhappy decadence of taste in England as well as in France, and, for awhile, the furniture of the period bore the impress of his hand. André Charles Boule, born half a century later, effected, as it were, a kind of artistic restoration in these matters; but it was long before the pernicious influence of Wendel Dietterlin ceased to be felt. There is not, so far as we are aware, a single genuine specimen of either artist's work at Bethnal-green. It was Boule who furnished the Palace of Versailles, in such perfect consonance with its architect as to draw from Mansart the remark, "Posterity will hardly know whether I built a palace for his furniture, or he made furniture for my palace." The principle upon which Boule worked was that of preserving as many straight lines as possible. His influence did not last long. The Berninis and the Borrominis came into fashion with their sinuous, irregular, and arbitrary lines; natural gave way to hybrid decorations; feathers, fruits, flowers, and shells were festooned together wherever room could be found for them; and Aurèle Meissonier came in to give the last touch of degradation by inventing that which is ignobly known, though not yet utterly repudiated, according to its deserts, as "Louis Quinze." "Pompadourism" flourished for a time, and then the equally obnoxious, if less flimsy, "modern Classic," stimulated by the discovery of Pompeii, took its place, preserved from utter pedantry by the genius of such men as Piranesi and his son, to whose aid came Louis David, who, without knowing anything of antiquity, possessed an antique genius, which he was not above displaying in the frame of a mirror or the canopy of a bedstead. The history of taste in furniture, indeed, is very suggestive, in its way, of other history. Napoleon's conquest of Egypt, for instance, produced a perfect eruption of sphynxes and obelisks in the drawing-rooms of Paris. There was a Walter Scott fashion, and a Byron fashion, in these matters, but a propensity has always been manifest, to return upon the traces of the Middle Ages. No traces of these latter are to be found at Bethnal-green; but the loan collection might have been made infinitely more instructive and valuable had it contained the means of a comparison between the old and the new arts in furniture,—the days of "solid," so to speak, and the days of "veneer," of which latter the French, in their Exhibition, appear so ambitious to get rid, — as witness the cabinet-work of MM. Mazaroz-Ribaillier.

MORE ABOUT THE ACADEMY PICTURES.

AMONG the works in which, whether including landscape or not, figures form the predominant interest, Mr. Marcus Stone's "The Post-Bag" (71) might perhaps have justly claimed earlier notice, for it is one of the pleasantest works to be found in Gallery I. It is an out-door breakfast-scene of the last century, in a sunlit garden of some Classic mansion: two elderly men in cocked hats sit over their coffee and letters on the right, and their fair companion stands apart from them to read her correspondence more privately. There is a touch of the theatrical in the garden landscape, perhaps not out of keeping with the socially artificial period suggested. The artist is not so fortunate in his figure-study called "The Time of Roses" (262), where he seems to have tried some not very comprehensible experiment in colour, for the same tone pervades the roses, and the face and dress of the figure. Mr. Edgar Barclay has a new subject treated with very artistic feeling in "Women moulding Water-jars, Algeria" (53); he exhibits a companion picture of the use of the same water-jars when made (183), also very clever and interesting. Among the half-decorative paintings of single figures which have become a kind of fashion, Mr. C. E. Perugini sends one, "Girl Reading" (96), which is highly successful in its way; a life-size figure of a girl in white seated, with head relieved against a background of foliage; an orange by her side forms the one bit of high colour in the work. We are getting to know this orange very well; a taste for oranges has set in among painters lately; but there is fine painting in the face and arms of the fair reader too, though the inspiration of the work is certainly borrowed. In the same room with this we meet with the first specimen of a young painter who is going to take a good place, Mr. Fred. Morgan, whose able works last year we noticed as showing a new talent, which is more than confirmed in his works this year, of which "Charity" (121) is the most prominent and perhaps the best. Mr. Morgan is closely related to the school of which F. Walker was the central type; a painter of rustic life in combination with landscape, and in this particular work reminding us very much of Walker in general feeling; but the pathos of his figures is far less tragic, and his landscape painted more in "the light of common day," with great force and freedom of execution. In his other large picture, "After the Reaper's Work is done" (357), more is attempted in the landscape, a deeper chord struck, but not quite with equal success. But this painter has earned a place and a right to be looked for in future. The second room contains the first exhibited work of Mr. R. Browning (son of the poet), a large figure of "A Worker in Brass" (130), which is interesting rather for the execution of details than as a whole; the head is deficient in power and expression, the hands of the figure and the metal work which he has completed, are very well painted; the picture is life-size. Mr. Boughton's "Waning of the Honeymoon" (172) is a bit of excellent and very refined humour; and an excellent though hardly refined work just above it is the "Member of the Long Parliament" (171), by Mr. Pettie, who contributes several others, all with more or less power, but nearly all more or less ugly; "The Hour" (64) is the most remarkable for both qualities;

a very plain woman in a crimson dress coming down a staircase: it is rather annoying to see so much force and cleverness expended on a painting which is yet so absolutely uninteresting in expression and subject.

Mr. Erskine Nicol is in his best vein of humour in his portraiture of the old dame who wonders if it is "A Colorado Beetle?" (177) that appears over the edge of the table at which she is seated; and Sir John Gilbert's "Ready!" (216) is a piece of brilliant *fanfaronnade* in his well-known manner. The best of the secondary works in the third room, however (if it can indeed be called secondary), is M. Grützner's "Vespers in the Monastery" (299), a very humorous portrayal of the scene in a modern monastery where travellers of various nationalities are receiving hospitality, when the bell for vespers sounds, and the "brother" in the middle of the room chants his devotions where he stands, while the strangers look on with varied expressions, some of conventional reverence, some of sarcasm, one, who obviously represents the English evangelical, with a kind of stolid and settled disapproval: the picture is a little heavy in colour, but very elever in drawing and expression. Mr. Brewtnall's "Beggar's Daughter of Bethnal-green" (90) has claims to notice, but is hopelessly marred by the affectation in the pose and manner of the figures.

In the fourth room we come on a very interesting work of Mr. Heywood Hardy, "Tipping" (314), a bit of contractor's operations on a new line of railway; a big horse has just been unhooked from the wagon full of ballast which he has been drawing, and is pulled sharply out of the way by his driver to let the wagon run on to the "tip"; another wagon has just been upset at the end of the embankment. This is a very clever thing, and the painter must have studied the manner and behaviour of horses on this kind of work very minutely to realise it so well. "Reviewing the Programme" (Rossi), "News from the Front" (A. C. Gow), and "Cats (F. Smallfield) are all good little bits from the same corner. Mr. F. S. Walker has a very original and telling work, "The Convent Garden" (345), a garden scene on a bright sunny day, where the serious and rather sad and faded appearance of a group of nuns in black in the foreground is emphasised by contrast with the gay manner of some young lady visitors from the outer world who are seen at the further side of the lawn; the execution is rather heavy and "loaded," but there is much feeling in it. Mrs. Luke Fildes's little bit called "Peeling Potatoes" (372) should be looked at, for refined yet broad style; and there is an interest attaching to Mr. E. W. Cooke's painting of the *Cleopatra* on her way here through a heavy sea and in the wake of a steamer. Mr. F. Goodall's "Palm Sunday" (397), a life-size painting of a young lady and a child seated in a window, has its qualities, no doubt, but does not interest us. Near this, one may note, as a clever curiosity, Mr. Blewitt's accurate painting in one of the Egyptian mummy-rooms in the British Museum, called "From out the Corridors of Time" (399).

Mr. Walter C. Horsley has hardly come up to his promise of last year in "Shopping in Constantinople" (408), at least as far as general artistic force and effect are concerned; in detail there is a good deal of character in the picture, but it is hard in execution. Another subject still further East, Mr. Chevalier's "Llama Priests at Home" (416), is very clever, and a real novelty in subject; it represents a group of these worthy, fat, and shaven Oriental clergy engaged over some game resembling draughts, while another reads to them; they are all clad in yellow silk gowns, producing a curious effect of colour, and their round heads and placid and somewhat stupid countenances are obviously studied from life. Where shall we go next for subjects for Academy pictures? "Ultima Thule" has nearly been reached now. It is hard work to find novelty of subject, and excursions into other times and other places than our own are necessary almost as a matter of course. Thus Mr. Laslett J. Pott places his card-playing scene, "Fallen among Thieves" (435), in a period of swords and silk stockings, and perhaps such complete rascality among people of such good surroundings would not be easily found at present; the contrast between the appealing young man who has been fleeced and the imperturbable face of the old sinner opposite to him is very well given, though the "situation" is not very new in painting. Mr. Erskine Nicol, in "Under a Cloud" (467), repeats the puffy-faced gentleman who was "his legal adviser" last year; and Mr. J. Watson Nicol more than keeps up his promise in his very clever picture, "To Our Next Merrie Meeting" (474), where one reveller sits on the table in a jaunty way to exchange healths with his companion. The large picture by Israels, "Returning Home from the Field" (461), is full of the most tragic pathos of everyday life, in the worn hopeless look of the wearied group trudging over the field; the gloom is almost too deep, and the cast of colour too leaden, for artistic success; yet there are great qualities in it, as in almost everything from the hand of this thoughtful and powerful painter.

There is a certain power in Mr. Colin Hunter's scene on the jetty of a fishing village, called "Store for the Cabin" (417), with a feeling a little akin to that of Israels; but the work is marred by the heavy and rather dirty-looking tone of colouring which pervades it, and which certainly does not suggest open-air effect. Mr. Blackbourne's "Roman Widow celebrating an Anniversary" (499), is really an architectural painting of the interior of a Roman burial-place restored, and is sufficiently clever in this way to have merited a better place. Mr. Rooke's "Death of Ahab" (533) does not keep up the promise which his "Ruth" last year certainly gave, though we were of opinion at the time that the merits of that work were a little exaggerated by the hanging committee and the critics. Gallery VI. contains, however, quite a group of clever works by painters who have not yet attained the pinnacle of fame. Mr. J. W. Waterhouse, indeed, may be said by this time to have made his reputation, at all events, by his last and best work, "The Remorse of Nero after the Murder of his Mother" (547): there is no very strong remorse expressed, but that may be intentional; as a composition there is undoubted originality, and considerable force in the painting. Mr. Helmick's "Wayward Daughter" (537), a saucy-looking lass who has offended her very sour-looking parents, is a small work of remarkable point and ability both of humour and of execution; Miss Havers's "June" (538), where a country girl stands by a stream under the shade of trees, is unusually successful in realising atmosphere, and the freshness of the country in early summer; "Her Last Sacrament" (543), by Mr. A. Stocks, though with a little touch of the "goody" element, has real pathos and feeling, and the same may be said of Mr. Dixon's railway-station scene, "It may be for Years" (546), in which there is also good study of varieties of character and expression. Mr. Cameron's "Haymakers at Noonday" (554), and Mr. J. Knight's "Pollie" (556), are worth attention; and Mr. W. V. Herbert's "Unwelcomed Visitors" (557) cannot be passed over, certainly, but one must name it with regret that a young painter of undoubted ability should have taken to such an affected unreal style, and almost tawdry colouring.

In Gallery VII. Mr. Edwin Hughes's "Distinguished Visitors" (572) is as clever and complete a thing of the kind as one can often see; it is the interior of a large mansion where the old housekeeper is showing the tapestries to a very richly-dressed young couple, the gentleman in a magnificent flowered waistcoat and green coat, such as was once considered the appropriate dress of a gentleman of means: the character shown in this figure and that of the housekeeper, and the almost faultless execution of every part of the work, render this a noteworthy little painting; one only feels that the ability displayed is almost more than so slight a subject is worth. Mr. Lamont's large picture, "The Prince's Choice" (610) is ambitious enough, but we really cannot see the point or interest of it, nor admire the very heated colour. "After the Confession," by Mr. Wünnenberg (616), should be looked at, and Mr. Bridgeman's little work "Having a good Time" (627), a couple of urchins, who have been bathing, rolling each other over in the sand; there is some capital drawing in this. Mr. Hodgson's large work, "Lost" (635) *must* be looked at, for one cannot help seeing it, but what it means we have endeavoured in vain to make out, except that it is a forcible painting of two Arab cutthroats and their gear. Mr. Blair Leighton's "A Flaw in the Title" (650) is very clever; Mr. Frère's "Le Chemin de l'École" (649), where a boy stoops his head awkwardly to squeeze under an umbrella, and yet keep it low enough to shelter his little sister, is in the artist's best manner. Mr. Elmslie has painted a scene which we should very much like to come upon in "An Autumn Walk" (647), and Mr. F. Slocombe interests us in the efforts of a young lady to learn "A New Song" (646) by strumming it over with one finger on the piano (a very bad way of doing it, musicians would tell her, but so far true that it is the usual way in England). This reminds us that we passed over a clever painting by Mr. Ormsby of a somewhat similar subject, "The Sonata" (481), and which should be mentioned the rather as the painter is a comparatively new man who is steadily improving, and always manages to give an original turn to the subjects he treats.

The Lecture-room contains a good many very clever things besides those already mentioned in our last notice. We first come upon "The Apple-loft" (904), by Mr. Arthur Hopkins, an admirable painting of two girls bringing apples up to the store, and excellent painting of apples also, which the artist seems to have studied "lovingly," as the phrase goes. Of less marked merit, but worth attention, are Mr. Chevalier's "Weary: an Episode at St. Leonard's" (917), Mr. Waite's "Mending the Well-rope" (922), Mr. Burr's "The Truant" (921), an unfortunate lad, who is certainly going to "catch it" from the irate old man who thumps his green umbrella on the floor. There is a good deal of feeling in "The Soldier's Wife" (942), by Mr. Geo. Smith, though the subject is a little hackneyed. The subject of Mr. F. G. Cotman's "Au revoir" (948), is a well-worn one also, but treated with such originality as to seem quite new. We look down a country lane, with a delightful old lichened wall at one side of it, and at the turn of the road a horseman looks back just before disappearing, the object of his regard being a pretty girl who stands at a gate in the foreground looking after him. The description sounds like a thing that has been done scores of times, but the present work reminds us of no other, and is charming in its own way. Mr. Fantin's "La Lecture" (955), a life-size painting of two girls, one reading to the other, is as powerful as his portrait of Mr. and Mrs. Edwin Edwards in a previous Academy, and more pleasing as a picture. Miss Thorneycroft's "Dives and Lazarus" is a painting we cannot like much, but recognise the talent and study displayed in portions of it. A little thing, by Mr. Claude Calthrop, "A Caller" (1004), has real humour and satire; the figure seated before us has just the regulation simper and affected interest of a commonplace woman paying a conventional call. We fear Mr. Macbeth's large work, "Sedge-cutting in Wicken Fen" (1016), will hardly do; there is power in it, but it is unreal and theatrical, and the man on the right is absurdly tall, measured by the size of his head. In the Tenth and last Gallery there are only two or three figure subjects that seem worth special attention: Mr. Pettie's "The Laird" (1325), an old long waistcoated gentleman of the style of the Baron of Bradwardine, who walks out to look over his acres in the pride of property, is perhaps the best thing in the room, and certainly the best of Mr. Pettie's paintings this year. Mr. F. W. W. Topham's large and crowded work, "Drawing for Military Service, Modern Italy" (1385), has a good deal of humour and interest in its portrayal of varieties in modern Italian character. "Après le Déjeûner" (1401), by Miss Kate Thompson, is clever, so is M. Gussow's head called "The Fruit-seller" (1394); and Mr. Weguelin's "Labour of the Danaïds" (1405) has some very fine painting and drawing in it, but it is of no use to treat a wild poetic legend in this matter-of-fact mechanical manner,—it becomes absurd; one is only inclined to say, "Why don't they stop up the hole in the barrel at once?"

We have something yet to say on portraits, landscapes, and sculpture.

Quick Work.—An American paper says that an interesting experiment has recently been made at the Michigan Central Railway Works in order to ascertain the very shortest time in which a locomotive engine could be mounted ready for use from the finished component parts. Two sets of fourteen workmen were employed, under Mr. Stewart, of Jackson, and Mr. Edington, each set to mount an engine, having all the parts of which the engine consists ready at hand. They accomplished the task in the remarkably short period of two hours fifty-five minutes, a bet on the result being won by Mr. Edington, who finished one minute sooner than his antagonist. Up to the present this work had been generally done by about five or six workmen in the space of from nine to fourteen days.

"IMITATED ARCHITECTURE" IN NEW YORK.

PROBABLY no city in the world may be said to make so large a show of imitated architecture as that at the very extremity of which, twelve miles from its Town Hall, we are now writing.

Even here, on ground much of which is still unbroken since the Weekquæseek Indians, the allies of the Dutch, came down to the Spuyten Duyvil Creek to fish for the nutritious shad and succulent soft-crab, or track the deer and wild turkey,—and it seems but the other day that they did so, for in the same years Charles II. was feeding his ducks in the waters of St. James's Park, and Mdme. de Maintenon brought her tit-bits for the famous Fontainebleau carp (the death of a survivor of which shoal most of us remember),—even here, at Spuyten Duyvil, with the gray rocks still asserting their real estate rights, are springing up in all directions many well-built, but too evidently imitated architectural villa residences, most of which have precisely that appearance which in England has for some years seemed to please a certain class of prosperous people, but which have generally drawn from the true lover of domestic architecture supercilious expressions of dislike. These are the sort of houses that give one the idea that the master is "in the city," the older children at finishing schools, the younger ones and the mamma, and perhaps her unmarried sister, in undisturbed possession of the house that is all but empty nine months out of the twelve. We all know the sort of house; they surround most large towns throughout England.

Unless the stranger who visits New York for the first time be an architectural expert, no matter how many large cities he may have visited elsewhere, he will scarcely escape arriving at the conclusion that never before has he seen so many magnificent warehouses, shops, hotels, and dwelling-houses, or more substantial churches, with a greater variety of steeples and ritualistic projections; larger plate-glass windows, or broader streets, and smoother pavements; and long after he has been forced to relinquish the idea that the pavements or the ways generally are all smooth, he will remain under the impression that architecturally New York surpasses any city of modern construction. Under this delusion many strangers on their way through the capital may leave the city, may carry home a want of knowledge of what they have seen, and will bear in their minds a doubtful remembrance regarding Stewart's great shops, the Women's Hotel, and other pseudo-marble palaces, and in after-years would be shocked to hear that the gorgeous recollections which have abided with him were, after all, inspired by shams and imitations of bad copies.

As yet a description of New York cannot lay claim to any resemblance to that delightful account quoted by Mr. Aitchison the other day from an English topographical dictionary describing a well-known city whose variety of architectural styles somewhat exceeded the conventional number that Pinnock and other great professional authorities early instructed us in. Here in New York there certainly is a Gothic cathedral resembling most Continental cathedrals of historic fame in one particular, that of not being yet finished; of this great work it is not for us to speak lightly. It already presents an appearance, especially from the Central Park, that commands one's warmest admiration, and if on approaching it the details are faulty and mechanical, what modern work has not that character?

Unlike the town described by Mr. Aitchison, we know no examples here from the temple of Ilissus, nor has the Queen Anne style been yet adopted; one famous house here, a house within a stone's throw of the entrance to the Central Park, is in a style which of late in England has been much lauded, an old English style; but it appears out of character, and in spite of its solidity, it has not the look of endurance.

Notwithstanding the very large amount of imitated architecture that exists in New York, there is so much that is truly original, that one might almost argue that the New Yorkers are on their way to a genuine architectural taste; they certainly build to suit their peculiar imagined requirements; everything here is large, almost in proportion to the size of their continent. In this respect there is no sham, and therefore their art must be better than people would at first suppose.

One New York building, at least, ought to escape wholesale or lightly considered condemnation, if only on the score of its perfect adaptability to the purpose for which it has been built, and in this respect the recently-opened New York Natural History Museum might be held up for imitation to the whole world; architecturally, this building, even in its unfinished state, is worth our admiration, and when viewed from many spots at a distance it forms a skyline that adds a beauty to the noble Central Park, on the margin of which it is built. As for its contents, and its perfectly arranged collections, Professor Owen himself might repose complacently with the feeling that a perfect commencement at least has been made.

In New York and elsewhere in America may be found a limited class of highly-informed Americans whose manner of life, and whose ways of thinking and acting, whose culture and refinement are quite in keeping with the idea that exists with other nations,—people, in fact, who are precisely in accord with similarly-gifted persons to be found in Europe.

But these happily-constituted and well-instructed individuals naturally holding themselves intellectually superior to the mass about them, show too great a disposition for a retired life, in which they dispense for their own advantage that fund of goodness that they are merely waiting for the growth of the society about them to participate in.

That ever-living question, the real estate interest in New York, seems to have resolved itself into certainty on the situation of their Faubourg St. Germain, which, for an American age, is likely to remain between the Fifth and Sixth Avenues as high up as 56th and 57th streets, where the owners of names hallowed in the New York world have already built and beautified a number of brown-stone-front houses sufficiently original to escape the stigma of being imitated from anything but genuine American prototypes.

That New Yorkers have not attempted to imitate some one of the many delightful Parisian residences known to them is a matter of wonder to us; and considering the attractions that the New York people have so long found in the French capital, and the manner in which they show their affection for the many aids to enjoyment and foolish vanity that Paris especially showers upon us, it is a little singular that New Yorkers specially have not imitated Parisian methods of housing themselves. We know in New York of no single house with a *porte-cochère*; and whatever objections may be brought to this feature for a climate like this, or that of London, those who have seen the magnificent effect of the *porte-cochère* enclosed behind thickly-glazed iron gates, such as exist in the Boulevard Haussmann, will remember the beauty and charm of the effect. Nor have they, oddly enough, imitated in New York the institution of the *concierge*, unless we may consider as an equivalent the "Janitor,"—a term, perhaps, of easier correct derivation, but carrying with it too classical an association to make it quite so domestic as we would like. The term *concierge* to the English ear has a peculiar fascination far beyond that which the individual generally possesses, the *concierge* with a very large class of Parisians being fair sport for that feeble idea of practical joking that Alphonse possesses. For our part, the habit of paying the *concierge* the attention that is due to our ordinary friends was never pleasant; but here in America the street-door intimacy that we have been called upon to indulge in with the "Janitor" is even more disagreeable.

It is to be sincerely regretted that the Americans have not more relied upon their own resources and their own early mode of living in almost every particular, and the reckless way in which they fall into the vice of imitation, and especially of imitated architecture, is to be deplored. In the days of their early history they, as all other thoughtful people have done, built and adorned their houses according to the exigencies of the moment, and naturally they availed themselves, so far as they were informed, of those methods and fashions that prevailed in older civilised countries; they had simply to make allowance for a difference of climate, which soon led them to protect themselves well from the cold of severe winter, and the scorching sun of a torrid summer. For more than two centuries houses have been built in many parts of America that other countries might imitate, or rather emulate, as regards the perfect fitness and complete propriety of all that makes a house a home.

Up to a certain period of their architectural history the Americans appear to have built nothing but what was honestly, and therefore beautifully done; there exist at this moment hundreds of homesteads throughout this country that have withstood the searching climate for much more than a hundred years; there still remain a sufficient number of examples of well-to-do houses to form a school of architectural domestic art, houses that Americans could refer to with a just pride.

English colonists, even those most honoured and favoured by the parent Government, appear not to have carried with them any thought of what we are in the habit of calling Elizabethan architecture, and what houses they built with the ample material at their command must have been designed essentially on Gothic principles, as regards simplicity and directness of construction. They doubtless thought little of those decorative arts that are now beginning to give so much trouble here. Moated granges, oriel casements, and tapestried chambers have added a romantic charm to American life and story merely in the pages of the romancists and historians, and it is only now that we have lost the significance of so many old ways that they are beginning here to imitate what takes but an imperfect place in their minds.

Notwithstanding the many intended-to-be picturesque mansions that have sprung up within the last few years (at present the lull is ominous), the old pleasant houses on Fourth Avenue, near Madison-square, still retain to our mind a look of abiding respectability that no single new house possesses.

We wonder New York does not imitate on a gigantic scale some of the *culs-de-sac* of Europe, or that it does not build for itself a *Palais Républicain*, with its covered ways; that it has not thought of having its own arcades and other ways dear to the New York Parisians. Such places would be exactly suitable to many of their bright, but cold, windy, dusty, spring days. But where all the imitation that exists here will end no one knows nor cares to trouble himself about, and imitated architecture, and this style or that of decoration, will flourish here yet for years; the good and the correct,—the truthful, in fact,—asserting itself now and then, until we have all arrived at that stage of perfection prophesied by Victor Hugo, when the whole civilised world will unite, like the seven primitive colours of the prism, to establish one beautiful tone of perfect brightness, when all the world will be draped in white,—the natural and scientific symbol of divine wisdom.

Spuyten Duyvil, New York.

SANITARY AND SOCIAL NOTES IN AND ABOUT DUBLIN.

THE NORTH CITY AND SUBURBS.*

FOR the first half of the present century the greater portion of the north city, that at least extending from the line of Capel-street to the North Circular-road, was a fashionable and wealthy district. Numerous private streets inhabited by families of the highest respectability were in this quarter; but the northern city proper, with the exception of a few streets and those in the vicinity of Rutland and Mountjoy squares, has, during the last quarter of a century, being rapidly going down. Its professional and fashionable populations have to a large extent departed, mostly to the southern and the seaside townships. It is a sad picture to witness in the north, as we have in the south, long lines of high and well-built houses, once inhabited by wealthy private families, now occupied from kitchen to garret by tenement lodgers, artisans and workmen, struggling seamstresses and lodging-house keepers. Labourers and quay porters now reside in parlours, drawing-rooms, and bedrooms once occupied by a resident nobility and affluent gentry. Many of the fashionable city houses and mansions are converted in their ground-stories into shops; and pawnbrokers and publicans, the sure signs of phases of social life that need not be particularly described, are to be seen everywhere.

We do not remember anything so rapid as the decline of house property in a large portion of the north city. If its two fashionable squares were invaded by lodging-house keepers, as some of their approaches are at present, or if any of the houses in them were cut up into tenements, we fear that the very worst would have befallen

* See p. 479, *ante*.

the north city. Ruin and dilapidation have already set in, and numerous fine streets of houses are given over to neglect. The houses are left unpainted and unrepaired from year to year by their present owners, and since their wealthy residents have left them the Corporation or its scavenging staff give little attention to cleansing the streets. The state of the thoroughfares almost everywhere, north as well as south, is bad. The finest, broadest, and most leading thoroughfare, Sackville-street, is in anything but a good condition, and the trees planted there are leafless and rotten. We find ruts plentiful, and mud, after the least shower of rain, in abundance. The road metalling put upon the streets is of the worst description of stone, and its laying seems to be done in the most perfunctory manner. We do not like to say a hard word against working men, but the scavenging staff of the Dublin Corporation is the worst that we have seen anywhere over the kingdom. Many of the poor fellows are long past their labour, or otherwise unfitted for the work. Although a deputy surveyor of the streets was lately appointed for their better management, little improvement is visible. The Municipal body are adepts at making appointments, permanent and temporary, the latter form being the thin end of the wedge for arriving at the first. It is not for the want of officers that the city, north and south, remains in dirt, neither is it for the lack of sufficient taxation. There have been for years past ample funds, if economically used, for sanitary purposes, but they have been shamefully wasted in legal and Parliamentary costs, in promoting and opposing Bills, in useless deputations, and in sundry other mad and mischievous ways. The citizens are paying the penalty to-day,—indeed, they have been paying the penalty of corporate neglect for many years past,—in periodic epidemics and a high rate of mortality. Several years have been wasted over a main drainage scheme, too costly and elaborate (even if it were thoroughly satisfactory) for the financial circumstances of Dublin. The aiders and abettors of this scheme, not having succeeded in their desires, have elected to do nothing, in the meantime, in ridding the city of its dirt or mitigating the pollution of the river, which every summer is an intolerable and dangerous nuisance. A main drainage arrangement is certainly indispensable for the city, but it needs to be well thought out, in respect to construction, outfall, and cost, matters in which the collapsed scheme gave rise to serious and well-founded objections.

A walk through that part of the north city lying between the Royal Barracks and Oxmantown and the line of Capel-street, brought under our view many deplorable pictures of ruin, wretched habitations, rookeries that ought to be demolished forthwith if possible, and heaps of dirt lying in the streets and in the backyards of the dwellings. In Mary's-lane in its entire length, and in the cross streets and lanes branching off, we found many sad evidences of dirt, decay, and human wretchedness. Off Church-street, out and about Pill-lane and Ormond Market, there was plenty of dirt and decay, tumble-down dwellings, unremoved nuisances, and foul-smelling drains. Indeed, whenever we stopped to converse with the poor dwellers in these places, and visit the inside of their dwellings, which we did pretty often, they informed us plainly enough that "the corporation men" seldom visited their quarter, and only swept the "leading streets." The olden meat or butcher markets of the North City have gone into ruin, for the butcher fraternity have migrated, and are to be found everywhere now scattered over the town.

Dublin has within late years, under the auspices of the corporation, obtained a new cattle-market, situated in the North Circular-road. The old market of Smithfield in the city is still used partly for the sale of milch-cows, pigs, and hay and straw. There is scarcely any city or town of importance in the three kingdoms which stands so much in need of good general markets as Dublin. A company was formed several months,—we might nearly write some years ago,—for the establishment of meat markets, &c., in the south city, but difficulties as to compensation and other matters having arisen, no active steps have yet been taken to carry out the project. The corporation, also, some years since, obtained powers to erect a public *abattoir*, but have not proceeded with the desirable work. The licensed slaughter-houses which are at present scattered over the city north and south, are situated in the worst neighbourhoods, and the greater number of them are kept in a disgusting state, ill-drained, if drained at all, and generally filthy within and without.

The Artisans' and Labourers' Dwellings movement in Dublin is very small in its dimensions. The Company has erected a limited number of blocks, north and south of the Liffey, in Echlin-street, Denmark-street, and Buckingham-street. These are but drops of water in the ocean of ruin and wretchedness which surges through the city from north to south. We visited and examined some of these artisan-dwellings. They are fairly constructed, and sanitary wants to some extent have been attended to. The rooms in these houses are too small, the spaces as yards at their rear too limited, and we hear of complaints as to their dearness. It is objected also that the company is letting the rooms of these dwellings to a class of persons who do not strictly belong to the artisan or labouring element. So long as there are hundreds of large rooms obtainable in the deserted town mansions and private houses, once occupied by the gentry, we fear that the artisan and labouring classes will prefer them to the new dwellings. The big houses once occupied by the "quality" are thought to be respectable, and month after month in the north city these private houses are losing their original tenants, and are invaded by tenement-lodgers. Their owners often keep them empty for months in expectation of a new tenant to occupy the whole of a house, but are obliged at last to surrender to the inevitable, and in rush the many to take possession where the one lived for years in quiet. A dozen of poor families living in those five-story brick houses, built originally for the accommodation of one private family, is not a pleasant social change or picture to contemplate. Many of these houses were undoubtedly well built, and are roomy, but as a whole they are entirely unsuited for the accommodation of a number of distinct families. Two or three years of occupation under their new condition are sufficient to wreck them considerably, and each advancing year adds to their ruin. It is a great pity that several of these houses in quarters where artisans' dwellings are needed are not taken possession of, and by some structural alterations and sanitary arrangements, converted into suitable dwellings for the working classes. At a little outlay many of them could be made excellent dwellings for the housing healthfully of a number of people.

In the northern suburbs strange contrasts are to be witnessed. In portions of the Phibsborough, Glassnevin, and Drumcondra districts recently a building movement has taken place, and a large number of private dwellings have been erected. We certainly must, from an examination of several of them, pronounce them to be purely speculative dwellings, and not a few of them badly built, and with bad materials. More eastward of the above districts, in the localities of Richmond and Fairview, once pleasant localities and healthy, and containing several avenues of good old, substantial, and well-built houses, house property for some years back has been going to ruin, and many houses are empty. The bad state of the river Tolka, which flows through a portion of the latter localities, and the recent erection of distillery buildings, as also the presence of some unsightly, smoky, and offensively-smelling works, no doubt have tended to drive away several of the old, respectable, and once resident gentry. Farther east, again, in the Clontarf district, along the margin of the strand looking on to the bay, with the distant prospect of the Dublin and Wicklow mountains standing out against the sun and sky,—a grand view,—a building movement, too, has set in. There could not be a more healthy locality than the Clontarf district from the sea-beach, stretching for miles inward to the very heart of Fingal. A large area of the latter district is surrounded by the sea, crested by the magnificent Hill of Howth; while out upon the waters, and within sight and easy access, are small pleasant islands. In the last century, and in the earlier years of the present, the northern suburbs, east and west, were a more favourite locality than the southern suburbs. A reaction, however, set in upwards of a quarter of a century since, as the tide of fashion flowed to the south side. Another cause of the desertion of the northern suburbs was the long-continued existence of turnpikes and tolls in that district, an impost which was considered obnoxious by sightseers, visitors, and strangers driving out, as well as by the residents in the localities named. The northern suburbs of Dublin, east and west, are certain to rise again into favour in the course of a few years. There is plenty of building land procurable and pleasant and healthy sites available. The localities, however, abutting on the city boundary are without a system of drainage, and this must continue to be a drawback. The Tolka river on the north side, as well as the Dodder river, and its tributaries on the south, must be kept clear of further pollution. It is difficult to see how the northern, and projected northern, townships are to dispose of their sewage before the main drainage of the city proper is completed. If the city systems were completed, the township ones could be made subsidiary to them; but in the absence of a thorough main drainage scheme, the northern townships have only the alternative of making the outfall on Clontarf Strand, or adopting a sewage utilisation scheme, and this ought to be first considered. A large portion of the sewage, if thrown upon the Strand by the former method, more particularly as the Strand is uncovered at low water, would be washed back again to the sea margin at high tides, and left there by the returning waters. The sea-beach would thus in a few years be transformed into offensively-smelling slob lands, and solid slime would take the place of golden sands. On the other hand, the present circumstances of the northern townships unfit them for adopting an expensive sewage utilisation scheme single-handed. The northern and other townships in the county of Dublin, if they adopt a sewage utilisation scheme, must be prepared to carry it out for some years at a loss, and be content to look at the matter from a public health point of view. The safety of the people is of more consequence than the profitable disposal of sewage manure. It will take many years yet before the Fingal farmers, or other County Dublin farmers, are got to believe in the fertilising value of town sewage, and to give up the use of stable manure. By the seaside the farmers use sea-wrack extensively still, and the cartage of stable manure from the city costs County Dublin farmers and gentlemen farmers considerable sums of money in the year. Manure is carted from the city for several miles inland, north and south.

A few words more and we end for the present. Dublin has certainly improved, and greatly improved, in her outlying townships during the last twenty years, and is still continuing to improve outside the municipal boundary; but with the exception of her port and dock improvements, and of public offices and warehouses in a few of her leading thoroughfares north and south, there is no marked improvement in her old northern and southern centres of trade. True two great cathedral "restorations" have taken place, and some city and several surburban churches for different communities have been erected; but there is a boulder of unmelting ice upon the city's heart. Here are disease and death, ruin and squalor, rags and wretchedness, ignorance and consequent crime, drunkenness and dirt, and sundry other social evils to be observed. To cap the climax, and patent to all, there is stark-staring wanton and long-continued municipal neglect on all sides. Dublin is more than half-sepulchred,—pressed to earth with taxation, poisoned with foul exhalations, choked with filth, and cheated into the somnolent belief that her Corporation is the model of propriety.

LANDING PIER AND CONCRETE WAREHOUSES AT THAMES HAVEN.*

THE STORAGE OF PETROLEUM FOR LONDON.

IN describing the works carried out for the Petroleum Storage Company, it will be well if in the first instance I explain the purpose for which they have been executed. It is usual to refer to the practices of the ancients when speaking of any specific work, but as petroleum has no history that I am aware of, except the discreditable history connected with the latest French revolution, I am spared any trouble in that respect. The inflammable character of the material, and the terrible explosion in the Regent's Canal a few years ago, have engaged the attention of the Metropolitan Board of Works, with a view of diminishing the danger to the crowded population of the metropolis from the storage of large quantities of petroleum

* Paper by Mr. William C. Street, Assoc. Inst. C.E., read before the Civil and Mechanical Engineers' Society, on the 9th inst.

within its area, the quantity in stock being generally about 50,000 barrels. The Thames Conservancy have already, with a view to the protection of the shipping in the Port of London, prohibited the discharge of any oil giving off vapour at a temperature under 100 deg. Fah. nearer London than Thames Haven. Having these considerations in view, a company was formed about two years ago for the erection of suitable storage accommodation, with landing conveniences and railway communication at Thames Haven.

At the present time, petroleum is brought to this country in vessels of about 600 tons register, with a carrying capacity for from four to five thousand barrels of oil, each barrel containing about thirty-six gallons. Those vessels bound to the Port of London containing spirits of petroleum are now discharged at Thames Haven into lighters, by which the barrels are brought up to the various wharfs and stores belonging to the London petroleum merchants. By availing themselves of the works now completed, the vessels can lie alongside a large and convenient pier at any state of the tide, and discharge their cargoes direct on to the pier and into the warehouses, whence they can be sent to London or elsewhere in small quantities, according to the requirements of dealers. There are now thirteen warehouses finished, each capable of storing about 1,400 barrels, and it is intended to finish forty-two or any larger number of warehouses, as the trade and funds may warrant.

The river at the part selected for the pier is in some respects admirably suited for the purposes of the undertaking, giving a deep water-channel very near to the Essex shore.

The first portion of the pier, that between the river-wall and the pier-head, is constructed of timber, and is about 220 ft. long and 16 ft. wide. The T-shaped head is constructed principally of iron, and is 90 ft. long by 32 ft. wide.

The ordinary tidal range at springs is about 17 ft., and at low-water springs there is a depth of from 24 ft. to 26 ft. close against the front piles, and as the bed of the river in front of the pier shelves considerably, there would be from 27 ft. to 30 ft. under the centre of a vessel of average width of beam, or a sufficient depth for the largest vessels at the lowest water.

The first portion of the pier has been constructed of timber, as, in the event of any extension of the pierwork being necessary, the iron end would probably be lengthened-out in the direction of a curve until it met the shore, thus giving a great extent of deep water quayage, with direct communication for a large number of railway wagons or trucks at the same time.

The construction of the timber portion is very simple, and does not require much comment. The piles are 14 in. by 14 in., driven into the ground by an ordinary pile-engine, the monkey weighing about one ton, and the fall being about 10 ft. The depth driven by the last blow was generally about ⅛ in., the silty substratum being very hard and difficult to drive into. The piles are as a rule driven from 10 ft. to 12 ft. into the solid. Each pier is composed of four vertical piles, with two additional raking piles for the last six piers. The spans are 20 ft. from centre to centre of piers, and the longitudinal beams are 14 in. by 14 in., with straining-pieces and struts also 14 in. by 14 in. The longitudinal and cross-walings are in two halves, each 14 in. by 7 in. The floor or deck is of 3 in. planks, and the handrail is formed out of 4 in. by 4 in., 6 in. by 6 in., and 8 in. by 4 in. stuff. The whole of the timber in the piles, walings, and floor has been tarred, and the handrail has been painted.

The construction of the pier-head was the subject of much consideration, as, though strong cast-iron columns have been used for the principal part, that metal is too brittle, and could not be relied upon for the front row of piles, which may have to take the impact of large vessels. The front row has, therefore, been constructed of wrought-iron, and they resemble long box-girders placed on end. The front and back plates of the piles, or what would be the top and bottom plates if they were considered as girders, are each 16 in. by ½ in.; the sides are 11 in. by ½ in.; and the angle irons at each corner are 3 in. by 3 in. by ½ in., all riveted together with ¾ in. rivets, 4-in. pitch. Lugs 6 in. by 6 in., 4 in. wide and ¾ in. thick, are riveted on at the proper places to receive the ends of the horizontal and diagonal bracing. These piles are each 54 ft. 5 in. long, and a timber dolly being placed on the top they were driven into their positions by a pile-engine similar to that used for the timber piles.

The three back rows of piles in the pier-head are of cast-iron, and are 12 in. external diameter, with 1 in. thickness of metal. They are fitted with screw-discs at their feet, the blade of the screw being 3 ft. 6 in. diameter, with a 6-in. pitch, and were screwed into their places from staging in the usual manner, by means of capstans into which eight bars, each 10 ft. long, were fitted. A rope was passed round the ends of the bars, and the capstans worked round by means of men hauling the rope on opposite sides with "double-purchase" crabs. Even with the force thus exerted, there was much difficulty in getting the piles screwed through the hard silt to the requisite depth, and two lengths of piles were broken under the torsional strain to which they were subjected.

The bracing is composed of T-irons 4 in. by 3½ in. by ½ in., and angle-irons 3 in. by 3 in. by ½ in., fastened to the flanges and lugs of the columns by two ¾ in. bolts.

The timber walings below low-water level were put together above water, and slidden down the sides of the columns to the required depths, where they were fixed in position by divers.

The insides of both cast and wrought iron columns have been filled in with cement concrete as a preservative against internal oxidation, and also as a preservative against the piles being cracked by water getting in between tides and freezing in the winter, as is sometimes the case in piers or viaducts exposed to the effects of a large tidal range. The whole of the ironwork is painted externally with Pulford's magnetic paint.

The deck of the pier-head is of 3-in. planks, laid upon joists 12 in. by 3 in., carried by longitudinal beams 14 in. by 14 in., resting upon the heads of the columns.

The front of the pier is protected by timber fender-piles, each 60 ft. long. and 14 in. by 14 in., with vertical rubbing pieces, 14 in. by 7 in., bolted on to them.

The pier-head has a cluster of timber piles, called a "dolphin" at each end. These are each composed of ten piles, each 14 in. by 14 in., with horizontal and diagonal bracing, 14 in. by 14 in. and 14 in. by 7 in. respectively. The centre pile of each dolphin is higher than the rest, and is fitted with irons at the angles, so that it may be used by vessels for the purpose of making-fast to the pier. The hand-railing on the pier-head is composed of iron standards, 3 ft. high, 6 ft. 6 in. apart, with chains of ½-in. iron between. Two strong mooring-posts are fixed at the front of each end of the pier, and vessels coming alongside will also be attached to mooring-buoys fastened to the bed of the river in the usual manner by screw moorings.

In addition to the landing accommodation provided by the deck on the surface of the pier-head, there are stairs running beneath the deck to landings constructed to suit low-water and mid-tide levels.

Since the completion of the pier, the river has scoured somewhat along its front, the run of the ebb-tide coming down Lower Hope Reach setting straight towards it, and the feet of the piles have had to be protected by the deposition of stone around them. The flood-tide runs up more on the Kentish side of the river. The average pace of the tide is about three knots an hour, but it varies considerably.

The pier is connected with the warehouses by lines of 4 ft. 8½ in. and 2 ft. gauges, the larger gauge communicating with other sidings, and with the London, Tilbury, and Southend Railway, and the smaller gauge being intended for the easy passage of small trollies of convenient dimensions for the carriage of petroleum barrels between the pier and the warehouses.

The warehouses at present constructed are thirteen in number, and are more properly large vaults, each 90 ft. long by 20 ft. wide, and 14 ft. high. The arch is a segment of a circle, with 3 ft. rise or versed sine, and is 15 in. thick. The arches are built of concrete composed of Portland cement and Thames ballast in the proportions of 1 to 5. The eastern and western end walls are 4 ft. thick, the southern or river-side wall is 2 ft. thick, and the northern wall and the cross walls are all 1 ft. 6 in. thick. The walls and the floor, which latter is over 12 in. thick, are also composed of Portland cement and Thames ballast, but in the proportions of 1 to 7. The concrete is some of the finest I have ever seen executed, but owing to the character of the foundation, much difficulty has been experienced in completing the job satisfactorily. On the surface of the marsh there is about 4 ft. of clay marl; beneath this the material is of a soft muddy bluish-clay character; this extends to a depth of about 24 ft., at which depth we reach the hard silt similar to that met with in the bed of the river. Acting upon the advice of professional men of considerable experience in works in that locality, the warehouses have been constructed on the surface of the marsh, trusting to the distribution of the downward pressure over a large surface of concrete footings and floors. This would probably have been efficacious, but some old ditches which ran across the site have rendered the supporting power of the marsh very variable, occasioning some settlements and several transverse cracks, which have from time to time given much trouble. In the end warehouse, and the one next it, at each of the extremities iron ribs and ties have been inserted, and the movement of the foundation has practically ceased. The piercing of the necessary holes for the insertion of the iron ties through the walls was a work of great labour, thus testifying to the character of the concrete.

The doors to the warehouses are of wrought-iron, fitted to cast-iron cills, but with Portland stone heads. The receiving-doors are flaps 5 ft. by 4 ft. 5 in., and the delivery-doors are a pair of sliding-doors, each 6 ft. 5 in. by 2 ft. 7½ in., running on roller-paths fitted on the inside of the heads.

The works are, as before stated, connected with the London, Tilbury, and Southend Railway, and the machinery for working the points and the signalling apparatus has been inspected and passed by the Government inspector, General Hutchinson, R.E. By means of this connexion the stores are placed in communication with the principal lines of railway in the kingdom, so as to enable petroleum merchants to supply from them the shopkeepers not of London alone, but of a considerable portion of the kingdom.

The works have occupied about eighteen months in execution, and their total cost has been about 22,000*l.* The contractor was Mr. William Eckersley, M. Inst. C.E., by whom the numerous difficulties presented were cheerfully encountered and the works pushed forward vigorously to their completion. The works have been executed under the superintendence of Mr. Brunlees, vice-president of the Institution of Civil Engineers, as consulting engineer; of Mr. Henry William Spratt as architect; and of the author (Mr. William C. Street) as acting engineer.

THE RULE AS TO DAMAGE FOR THE OBSTRUCTION OF ANCIENT LIGHTS.

THE question of the obstruction of light has frequently formed the subject of papers in the *Builder*. But there is a point connected with this matter which is of sufficient importance to demand some consideration, especially as it has quite lately been somewhat elaborately discussed in the courts of law. The point is as to the amount of damages to be awarded when an obstruction to the light of some building has been proved. It will, therefore, be noticed that we have now nothing to do with any questions as to the right of persons to legal remedies on account of some obstruction; but as to the rule by which the amount of compensation which they should receive ought to be assessed. And this particular branch of the subject is of great importance, also, because even in the courts of equity, when a person whose lights have been darkened seeks not any actual pecuniary indemnity, but merely that the man whom we may term the obstructor should be prevented from continuing his work, or should destroy the offending part, there must have been substantial injury done to the building in question in order that a court of equity may interfere. What falls within the term "substantial damages" may vary according to the mind of the person who considers the subject. Vice-Chancellor Wood (the present Lord Hatherley) spoke of substantial damages "as distinguished from some small sum of 5*l.*, 10*l.*, or 20*l.*"; whilst the present Master of the Rolls talked of substantial damages as considerable damages, and added, "some people may say that 20*l.* is substantial damages," thus apparently differing from Lord Hatherley, who thought that 20*l.* hardly fell within the term. But whilst men's minds may differ on this subject, it is yet obvious that the word "substantial" must be considered a relative term, that is, in relation to the building to which the injury is done. For example, it might be

that 20*l.* damage done to a large mansion worth 800*l.* or 900*l.* per annum would hardly be considered a sufficient amount to enable a Court to interfere to prevent the objectionable works from proceeding; but, on the other hand, the same amount of damage done to a house of the annual value of 50*l.* might most justly be considered ground for the interference of a Court of Equity. Thus it is clear that we must not lay down a hard-and-fast rule as to what sum constitutes substantial damages, otherwise it is more than probable that if carried into practice it may cause both loss and disappointment. All the circumstances of the individual case must be considered, and though we may regret that the imperfection of human law and human undertakings prevents any distinct rule from being laid down, it is obvious that to consider the term substantial in a relative sense will in the end be most just and most likely to meet the practical requirements of the time. What is, or is not, substantial damage,—in some respects, perhaps,—becomes thus of more importance to lawyers than to builders or architects, though it is advisable that this somewhat subsidiary point in regard to the rule which regulates damages should not be overlooked by any one who is in any way concerned with buildings or building operations.

We now come to the second and more important point of this matter, one which we are glad to think has at length been satisfactorily and properly settled by the Courts of Law after a long period of uncertainty. The rule, then, as it now stands, is that a person is entitled to receive pecuniary compensation by way of damages for any deprivation of light to the detriment of the dominant tenement, without regard to the purposes for which this tenement is used. In the year 1808 the case of Martin *v.* Goble (1 Campbell, p. 320) was decided, and it was then held by the Court of Exchequer that regard must be had to the purpose for which the building had been used, where the right to the light was accruing. In that case the person invoking the aid of the Court was the owner of a dwelling-house which had previously been used as a malt-house. It was held that the house was entitled to the degree of light necessary for a malt-house, and not for a dwelling-house. "The house had for twenty years enjoyed light sufficient for a malt-house, and up to this extent and no farther the plaintiff could still require that light should be admitted to it." Therefore it was clear that a rule was laid down which might sometimes render the amount obtainable for damages exceedingly small, and sometimes might even deprive a plaintiff of his remedy altogether. It is unnecessary to go through all the subsequent cases, but we may take our readers at once to the year 1874, in which the case of Aynsley *v.* Glover (43 *Law Journal* Reports, Chancery, p. 776) was decided by the Master of the Rolls. The point in that case arose because it was urged that the room deprived of the light was a smoking-room, and that this deprivation of light, great though it might be, would not interfere with the comfort of those who used the room or deprive it of its value as a smoking-room. This was practically Martin *v.* Goble over again in a different form, but the Master of the Rolls would not abide by that or kindred decisions, and came to the very proper conclusion that "the change of use of a room will not deprive the party complaining of his right to the access of light, and conversely, in considering the injury to the light, the Court is bound to consider that the room may be used for some other purpose than that for which it is used at the moment when the injunction is applied for." So that here there is a clear and definite rule laid down in relation to the use of rooms which it will be observed are on a precisely analogous footing with houses, and therefore the reasoning applicable to rooms is equally applicable to whole dwellings, and conversely the reasoning applicable to dwellings applies with equal force to rooms.

Let us turn now to a still more recent case, decided during the present year (Moore *v.* Hall, 47 *Law Journal* Reports, Queen's Bench Division, p. 335), in another division of the High Court. The point here arose because, though the house as to which the action was brought was generally darkened, yet the bedrooms, which suffered in particular, were still as useful for all practical sleeping-purposes as they were before the warehouse which took away the light was built. Here, again, the Court held that the particular use to which rooms or houses might at a particular moment be applied was not to form the basis of the rule by which damages were to be regulated. On the contrary, to apply Lord Chief Justice Cockburn's proposition almost literally, in estimating damages for the admitted interference with the access of light to a person's house, it may fairly be taken into consideration whether the tenement will always be applied to the same use as now, or whether there is a reasonable probability of its being applied to some other purpose for which the full light will be wanted. This, as it appears to us, is the proper and reasonable rule; of course, the light required by a warehouse in the City would not be the same with that needed by a dwelling-house in Kensington, and the rule must be applied and read in a reasonable manner. For, after all, the true measure of damages is the diminished value of the premises, and this cannot be ascertained simply by reference to the present use of the premises, for in the course of a very short time they may be used for a purpose for which the full access of light is wanted. Take, for instance, a small tenement in which an upper room has been used as a bedroom, and the height of the window was ample for that use. Then suppose, to continue the illustration, that the owner lets it to an artist, and puts a skylight in the roof, letting in a great quantity of additional light. It would be obviously absurd if a man might come and say, "Now you have a vertical light I shall interfere with impunity with your horizontal light, because it will be quite enough if I leave you sufficient to use the room as a sleeping-apartment as before.

The rule, therefore, is plainly a very proper one; for if the amount of light for a particular purpose were a test, it would introduce the still further complication, that nobody would ever be able to agree how much light was really required for the particular purpose to which the room was put, which would be an endless source of disputes; and it follows from this rule that there is a secondary one of some importance, that if a man possesses a right to light through ancient windows of small size, and increases them, and if a person obstructing the new light at the same time obstructs the ancient light, that the courts of law will interfere. Of course, in twenty years, the person who complains will in that case gain an equally valid title to the right to what we have called the new light. This, as we have said, is a somewhat subordinate point, but it is still one of some importance, because it might appear at first sight as if a person complaining were gaining an undue advantage, which, in fact, he does. But, on the other hand, it must be borne in mind that in the majority of cases the effect of the new lights in preventing the erection of new buildings will be infinitesimal if there were at the same spot ancient but smaller lights entitled to this easement. And even if hardships may sometimes occur through this rule, it is questionable whether this is not the least of two evils. But, at any rate, such is the law as it now exists. Taken, however, as a whole, the legal principles as to this question of the rule in regard to the damage to lights are fair and equitable, and well fitted to do justice to all parties. To recapitulate them briefly, they are,—Firstly, in order to obtain the aid of a court of equity, there must be a "substantial" interference with the light,—that is, substantial damage, in a relative sense, must be done; secondly, the injury to the property generally, and not in regard to the use to which at the moment it is put, is the main ground upon which damages may be recovered, or, indeed, for the interference of the powers of the law; and thirdly, after a material alteration of ancient lights, a person cannot obstruct the additional or new lights, if by so doing he, to any appreciable extent, interferes with the acquired right to the ancient lights.

Mission-hall, Birkenhead.—A new mission-hall, in Brassey-street, Birkenhead, has just been completed by Messrs. Ritchie & Davidson, builders, of Westbourne-road, Birkenhead, under the superintendence of Mr. James N. Crofts, architect, Liverpool. It contains, on the first floor, a hall 50 ft. by 24 ft., and 15 ft. 6 in. high, capable of seating about 230 persons, with a committee-room attached; and under the same, on the ground floor, are six class-rooms and an infants' room, with all necessary conveniences. The contract for the building, including boundaries and extras, was a little under 1,400*l.*

WITHDRAWAL OF THE WATER BILLS OF THE METROPOLITAN BOARD OF WORKS.

The Metropolitan Board of Works have stayed proceedings on both of their Water Bills, viz., that for the double supply of water, which was to render unnecessary the purchase of the existing undertakings, and that to authorise the purchase of the existing undertakings. We ventured to predict, some time ago, that this would be the case. But what we are not able even now to predict is, that the Board will take warning by the general opposition that the proceeding has awakened, and by the keen and destructive criticism which has been applied to these projects; and promise not to undertake any colossal measures in future without some kind of preliminary assurance that they will meet general support or public approval.

We are, as our readers are aware, among the last to express satisfaction with the state of the existing water-supply of London. But the more anxious any one feels for improvement in this respect, the more strongly must he condemn hasty and inappropriate action. There can be no doubt that any future measures of reform or of control have been already rendered more difficult by the proceedings of the Metropolitan Board of Works. As it is, the companies, in anticipation of the proposed purchase, have increased the water-rates in various districts, and thus added a further tax on the ratepayers. If the existing water companies wished to remain without check or supervision, they could not take a more effectual means than to encourage the presentation to Parliament of wild and ill-digested schemes, which excite general condemnation, and the only result of the introduction of which is the infliction of a heavy bill for Parliamentary and engineering expenses upon the ratepayers. We need not express our own opinions alone in this matter. At the meeting of the Board of Works on the 10th current, one of the members spoke out pretty plainly. Mr. Leslie said that the Bills, even if dropped at the present stage, "would cost the ratepayers some 12,000*l.*, which went into the pockets of professional men,—engineers, lawyers, and Parliamentary agents." He was glad that the Bills had failed, and said that "before long the wire-pullers should be unkennelled." Nor is the cost to the ratepayers all that has been caused by the abortive and ill-considered schemes as to which Mr. Runtz promises that "the Board would not let the question drop." Mr. Roche's memorable boast, "that the Board were not afraid of expense," seems fairly to express the sentiments of that body. We question how far the ratepayers and vestrymen will be pleased with the annual addition of even so small a sum as 12,000*l.* to the salaries and expenditure of the professional officers of the Board, paid them for taking into Parliament Bills so drawn that their movers have not even ventured to ask for a second reading. But this sum represents only a portion of the money-cost inflicted on London, to say nothing of harass and loss of time. Every one interested in the matter appears to have done something to oppose the Bills. The water companies petitioned Parliament to reject them. The Lord Mayor, aldermen, and citizens of London, in Common Council, petitioned Parliament to reject them. The Vestry of St. Pancras petitioned Parliament to reject them. The representative meeting of the Vestries and district Boards of the metropolis, held at St. Pancras Vestry-hall on February 15th, 1878, was loud in its denunciation of the measures in themselves and of the conduct of the Board in regard to them. The Bills themselves were propounded in the teeth of the reports of the two committees of the House of Commons,—that of 1867, and that of 1869. No single good word, as far as we are aware, has been uttered in their behalf by any individual whatever who was neither a member nor an official of the Board of Works. The two Bills were based on arguments that were mutually destructive. The hydraulic character of the works proposed was such as to provide an enormous pressure, of upwards of 200 pounds on the square inch, over a portion of the closed system of pipes, while the jet-power over another important part of the area of the metropolis would have been *nil*. No doubt the Board acted wisely in not throwing the light of a Parliamentary inquiry on schemes so jejune.

But our protest is on behalf of the ratepayers. It is bad enough to ask them for 12,000*l.* to pay

for the blunders of this year. But the Board, as far as their opinions are represented by Mr. Runtz and Mr. Roche, will not be contented with this. They "will not let the matter drop." It is, unfortunately, but too likely that as long as large parliamentary bills are annually paid, out of the pockets of the ratepayers, by a Board that "does not fear expense," the question will be kept alive. Surely it is a ratepayers' question; and we should be glad to hear what the ratepayers have to say about it. If they are content to pay nearly double water-rates for the privilege of putting the control of the waterworks in the hands of the Metropolitan Board of Works, it is not worth while to say anything more as to such a bagatelle as an annual expenditure of 12,000*l.* for the luxury of depositing Bills for that purpose.

ST. MARGARET'S CHURCH, WESTMINSTER.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

AT the evening meeting of this Society on Monday last, Mr. Alfred White, F.S.A., in the chair, the papers read were (1) "Notes on the Kilburn Brass," by Mr. J. G. Waller; (2) a communication read by Mr. J. E. Price, F.S.A., from Mr. C. Roach Smith, F.S.A., with reference to Roman coffins; and (3) "Notes on St. Margaret's, Westminster, and the Ancient Remains uncovered there during the Restoration under the late Sir George Gilbert Scott," by the Hon. Sec., Mr. George H. Birch, A.R.I.B.A. We limit our report to some notes of the last-named paper, and may return to the others next week.

Mr. Birch observed that St. Margaret of Antioch, to whom this church, in common with two others in the city of London, was dedicated, was greatly in favour with our forefathers in the Middle Ages, and in sacred and legendary art she occupied a very prominent place, in common with SS. Catherine, Barbara, and Ursula. St. Margaret's, Westminster, occupied so prominent a position, nestling, as it were, under the very wing of the great Abbey adjacent, that it could not fail to be a matter of speculation, in the minds of all who remarked its comparatively small and flag-surmounted tower, as to how it came there at all, and why it was wanted. Regret had frequently been openly expressed that the church had not been swept away, in order to throw open to view that side of the Abbey which it was supposed not only to conceal, but to absolutely disfigure. It was not worth while to combat that opinion, or even to suggest the many reasons for keeping the church, æsthetically, historically, and archæologically; they would be apparent to all who took the trouble to think. Some writers had laid it down authoritatively that when Edward the Confessor rebuilt the ancient abbey founded by Sebert, he thought it would be a dishonour to his new and stately edifice, and an annoyance to his beloved monks, if the neighbouring people assembled for worship in the Abbey as they had been wont to do, and that about the year 1064 (so circumstantial are they) he caused to be erected, on the north side of the Abbey Church of St. Peter, a church dedicated to the virgin martyr St. Margaret of Antioch, for their use. No authority, however, could be found for these statements. The earliest notice of the boundaries of the parish is contained in the charter of King Edgar, A.D. 962. At the prayer of St. Dunstan he granted or sold a confirmation to the abbey of a certain portion of land, only containing then five houses. The money equivalent was a golden armilla. This grant was preserved in the British Museum, and attached to it was a description in Saxon of the boundaries of it, which Sir Henry Ellis thus translated: — "First up from the Thames along Merfleet (the marshy site of Whitehall) to Pollen Stock, so to Bulinga Fen (Tothill-fields), afterwards along the Fen by the ditch to Cowford (Buckingham Palace), from Cowford up along Tybourne (by Vauxhall Bridge), to the broad military road (Oxford-street), following the road to the old stock of St. Andrew's Church, then within London Fen, proceeding south on Thames to mid-stream, and along the stream by land and strand to Merfleet." This ancient parish was subsequently sub-divided into many others,—St. Clement's, St. James's, St. Martin's, St. Mary-le-Strand, St. George's, Hanover-square; St. Anne's, Soho; St. Paul's, Covent-garden; St. John's, Westmister; &c. The church said to have been erected at the instance of the Confessor, very likely a small and inconvenient structure, remained until the time of Edward I., according to Stow, when it was pulled down and entirely rebuilt, the nave and aisles at the expense of the parish and the merchants of the staple, and the chancel and aisles by the Abbey of St. Peter, to whom the advowson belonged. The Rev. Mackenzie Walcott, in his history, implies that this rebuilding was not until Edward II.'s time, *circa* 1350, but in another passage he confirms the statement of Stow, and mentions a rebuilding or considerable alterations in Edward IV.'s time. There was, however, little doubt that the present church was rebuilt entirely at one period, most probably in the reign last mentioned. Walcott, while quoting Stow, on whose sole authority rests the statement about the parishioners being turned out of the Abbey, considers that the change of site was necessary in consequence of the number of bad characters attracted by the privilege of sanctuary, and who lived in defiance of justice. The chapels and chantries within the church included those of the Holy Trinity (south aisle), Our Lady (north aisle), St. Margaret, St. George, St. Catherine, St. Erasmus, SS. John and Cornelius, St. Nicholas, and St. Christopher. Of the few remains of ancient stained glass in London, the most perfect and complete is certainly the superb east window. According to well-known tradition, it was originally intended by the magistrates of Dort, in Holland, as a present to Henry VII., but the king dying before it was presented, it fell into the hands of the Abbot of Waltham, who kept it in his church until the Dissolution. Robert Fuller, the last abbot, to preserve it sent it to New Hall, where it remained until the time of General Monk, who had bought that property from the Villiers family, and by whom the window was supposed to have been buried to preserve it from the Puritans, and afterwards replaced in the window of the chapel. The chapel was afterwards demolished by the then possessor, John Olmins, but he preserved the window for the purpose of selling it to some church. In the British Museum is preserved a letter from him to Dr. Swinton, Wadham College, Oxford, to this effect:—

"July 30, 1738.

Dear Doctor,—Having some time ago made the purchase of an old house where there is a fine chapel, and not being yett old enough to stand in need of the assistance of a chaplain for the use of my maids and female neighbours, I have resolved to pull it down; and knowing right well that you are a great dealer in *virtu*, I thought proper to acquaint your Holyness that there is one of the finest large windows of painted glass in England, which I desire you will make known to the good people of your Colledge that they may depute you to take a view of it. If they like it they shall have it, in honour to you, for less than any else. If your Colledge should not buy it, I shall be obliged to you to mention it to some of the others, for it is a thing of value, and I am certain they will be glad of it."

Not being successful in this respect, the possessor cased the window up, and so it remained for some years, until it was finally sold to a Mr. Conyers, of Copt Hall, Epping, for 50 guineas. Here it remained until his son, in 1758, sold it for 400 guineas to the committee for repairing and beautifying St. Margaret's, and so at last it rested within a very few feet of the place for which, according to popular tradition, it had been designed nearly 300 years previously. There was, however, no authority for the statement that the window was originally intended for Henry VII.'s Chapel. Rickman states that the window was ordered by Ferdinand and Isabella, as a bridal gift, when Catherine, their daughter, was affianced to Arthur, Prince of Wales. The subject of the window is "The Crucifixion." The church contains some interesting monuments, including a tablet to Sir Walter Raleigh, who was buried in the chancel. In Weever's "Funeral Monuments" there is a description of a curious tomb, formerly existing in the north aisle, of Lady Billing, 1499. It represented the Almighty shedding rays from above on the Blessed Virgin, who, by label, was saying, "Behold thine handmaid!" On the right was an angel, with the label, "Hail, Mary!" During the restoration now in progress, behind the pewing has been found a monumental recess in the north aisle, with remains of this painting of the "Annunciation," as usually depicted. The traces of colour were more distinct when first uncovered, but a solution of shellac has been applied, to preserve what remains. At the back of the recess there seems to have been a small brass inscription, and the top of the tomb seems also to have been inlaid with brass figures. The arch and spandrel have been knocked away, leaving only the square opening and outer moulding. In Smith's "Antiquities of Westminster" is a curious plate representing the interior of the church, from a rare print by Brook prefixed to Warner's edition of the Book of Common Prayer, printed for Crockett & Hodges. The view is taken looking east. In this view a gallery is seen in the north aisle, stopping short at the chancel, the last two bays being clear. The altar-piece seems to be of the usual Wrennian character, and consists of a broken curved pediment with central urn, the usual Tables of the Law, and cherubs' heads. Within the rails,—which are spiked at the top, presumably to prevent people sitting on them,—is a monumental effigy in a kneeling position against the north wall, and a recumbent effigy below it. So accurately is the interior represented, that even a small corbel supporting one of the stone shafts for the roof principals is shown correctly as it still exists,—an angel bearing a shield on which is a Catherine wheel. The roof is flat and divided into panels, with rosettes in the centre of each and curved pieces coming down on to the clearstory walls. The windows are flat-headed, of two-lights, with cinquefoiled heads. Standing within the present fabric, though yet encumbered with scaffolding, the transformation which has been effected is seen to be so marvellous that the beholder can scarcely realise that it is the same church. The building has gained immensely both in seeming height and length. It is no longer the "little" Church of St. Margaret. From the west door the eye takes in the whole unbroken length of 130 ft. The exquisitely-beautiful nave, arcaded in eight bays and a half, with its coupled clearstory windows and panelled oak roof, is before the spectator in one unbroken view. The aisles, seen through the nave arches, increase the long perspective, and give that appearance of space and lightness so characteristic of Perpendicular churches. There are a monotony and tameness in the arcades of our London churches of this period,—as St. Andrew Undershaft's; St. Olave's, Hart-street; St. Ethelburga's, and St. Helen's, Bishopsgate,—which are wholly wanting in St. Margaret's, where the detail of the work is so vastly superior. It would be difficult to find a better-proportioned arcade than this of St. Margaret's anywhere. The rather stilted proportion of the bases, the tracery in the spandrels, and the richness of the mouldings, are very superior to the same items in the churches before mentioned, where the mouldings of the arches and piers are continuous, and the arches themselves four-centred. Few churches had undergone greater degradations, both internally and externally. It had been shorn of its length by one bay of the nave being divided off as a vestibule at the west end, and again at the east end by the intrusion of a semicircular sacrarium, with a domed roof in plaster; the north and south aisles curtailed of their length by the intrusion of vestibules with staircases; encumbered with huge galleries on three sides; pewed bewilderingly above and below; and the stonework and walls hidden under plaster and paint which had darkened to a treacly hue by age and dirt. The tracery of the windows had been barbarously altered; wretched monumental slabs blistered the walls, and were even stuck on to the plaster divisions forming the ceilings beneath the galleries. The mouldings and strings and piers had been cut and hacked about to fit pews. There was a perfect charnel-house below the pavement, and externally every architectural feature had been pared and toned down to one tame and insipid flatness by "neat" courses of Portland ashlar, and a porch most fearfully and wonderfully made added at the western end of the nave, in the "Druidical" style, as it was somewhat proudly called by the parishioners. Entrances had also been made in the east walls of the north and south aisles. The gallery was continued across the west end, thus depriving the church of another bay, and the roof was plastered internally in panels, after the "Gothic" manner of Strawberry Hill, and a wheel-window inserted in the east gable after the same fashion. The tracery of the windows had been removed, and a meagre and thin imitation of Gothic work inserted in its place. The same process was applied to St. Margaret's which had been applied to the huge abbey church. Every bit of interesting detail had been pared off as if it had been skinned, and the building, to quote the graphic descriptions in guide-books, had "a plain and neat exterior." Whatever faults may have been committed under the name of "restoration," such faults or errors

could not be quoted in the case of the restoration now in progress. Of late a good deal had been heard of the misdeeds of restorers, and the piety and devotion which would seek to cleanse God's house from the awful desecration of neglect and private greed had been stigmatised almost as a crime. The author said he had too much confidence in the sound practical common sense of the age to believe, when the question was before people as to whether a sacred building should be devoted to and rendered fit for the uses for which it was originally designed, or whether a maudlin sentimentality for whatever had been done in times past should be an excuse for continued encumberment and disfigurement of the church, that the latter sentiment would for one moment prevail. Unless the wretched plaster apse had been removed, the "history" of the old east window and the remains of the reredos beneath would never have been confirmed. The removal of the galleries corroborated the churchwardens' accounts as to the rood-loft. Again, the remains of the tomb on the north wall confirmed Weever's description, and in many other respects the restoration had proved of the greatest value and assistance to antiquaries, and when, as at St. Margaret's, the things discovered were carefully preserved to tell their history to future generations, surely restoration was a blessing instead of the curse which some people said it was. The church had a narrow escape in the time of the Protector Somerset. He was about pulling it down as a quarry for his new house in the Strand, and the scaffolds were already erected, when the parishioners rose to a man and pulled the scaffolds down. In conclusion, Mr. Birch described some of the discoveries which had been made during the restoration. These included a stone figure of St. Margaret, about life size, with the colours still bright upon it (portions of this figure, including the bust and one of the feet in the act of treading upon a dragon, were exhibited); a portion of the rood-beam; a head of a small figure, supposed to have been a Christ; the lower portion of another small figure very delicately coloured and gilded, &c. The following are some of the entries in the churchwardens' accounts:—

"1478. The day of burying W. Caxton, 2 torches & 4 tapirs at a low Mass, 1s. 8d.

1498. For the knell of Eliz. de Word, widow of Wynkyn, 6d.

1508. For bringing the organs of the abbey into the church, and bering them home again, 2d.

1510. The said wardens now accomptants of Mrs. Eliz. Morley widow towards the making of a new rood Mary & John in the Roode loft, at the time that the parish be of power and substance to make and build the said roode left the sum of 10*l.*

1517. Water Gardinr to the making of the roode loft, 38*l.*

1531. Paid to Renacever, Payntour, for painting and gylding the 60 stories of S. Margaret's tabernacle, 3*l.* 6s. 8d. Gilding 12 small images for do., 2*l.* 8s.

1541. Pd to Roger Weston for the taking down of our Lady's tabernacle at Rouncyval* and for setting up thereof in the Trinity isle, 13s. 4d.

1550. Pd to him that did paint and write the 6th chapter of S. John's gospel in the Quire, 2*l.*

1554. Pd to a painter for washing out the Scripture of the High Altar table, 1s.

1556. Pd to Nicholas Clarke, for making the image of St. Margaret, 11s.

1559. Pd 2s. 8d for 3 days work takin down the roode Mary & John, the table on the High Altar, and the holy water stock, and for clearing and sawing of the rood.

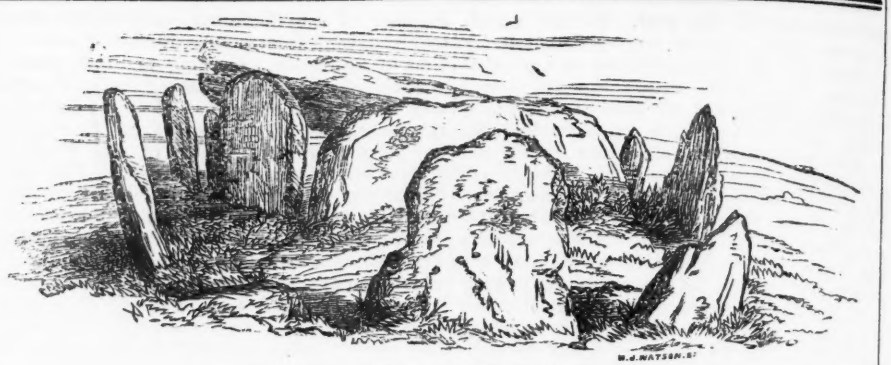
1610. To Goodwyfe Wells for salt to destroy the fleas in the churchwardens' seat, 8d.

1644. 1 13. 4. received for 29 lbs of fine brass and 96 lbs of coarse brass taken from sundrie tombs; 2*l.* 10s. of Arthur Condall for the screen and organ loft; and of Edward Stanthwaite, for having company in his house on a fast-day, and for swearing, 11s."

A short discussion ensued, in which Messrs. C. R. B. King, J. T. Micklethwaite, and the chairman took part, and votes of thanks having been accorded to the readers of papers, the meeting terminated.

Competition. — At the annual meeting of the Liverpool Architectural Society, the subject of the competitive plans for the additions to the Children's Infirmary having been introduced, it was resolved that having been made acquainted with the fact of the committee of that charity having invited architects to compete for a proposed alteration of their premises on the terms that all plans sent in should become the sole property of the committee, 10*l.* being paid to each unsuccessful competitor, the society expressed its regret not only that such a derogatory offer should have been made, but have been persisted in after its peculiarity was pointed out, and more particularly regretted that any architect should have acquiesced in any such terms.

* St. Mary Rouncival, occupying part of the site of Northumberland House.



Dolmen, with Peristalith, Brittany.

ANTIQUITIES IN BRITTANY.

A LECTURE entitled "Pen and Pencil Sketches in Brittany," was delivered before the Fine Arts Society, Conduit-street, on the 16th inst., by Dr. John S. Phené. The lecturer, after detailing many of the sylvan beauties, and subjects for the pencil, of the *châteaux*, moorlands, and forests, gave an outline of the rise and progress of landscape art, which he contended was purely the offspring of freedom of religious thought in combination with literary refinement, and described many of the strange and still existing rites and ceremonies of the Bretons. Some of these have clearly been engrafted on anterior ceremonies of the preceding Pagan faith. In a district described as "the district sacred to the sun," a large number of horses join in the sacred processions on the religious festivals; horses, in the ancient faiths, having been sacred to the great luminary. In another part, horned cattle take the post of honour. In almost all these quaint ceremonies, a sort of Saturnalia is permitted, which, when at its height, in the frantic gesticulations of *la danse ronde*, cider-drinking, singing, and a Babel of sounds, accompanied by discordant instruments, is suddenly hushed by the chanting of churchmen, and a long procession of penitents bearing lighted tapers. Some of the strange legends of the country were recounted, and the still existing superstitions, which hang about the standing stones, even yet venerated by the peasants. The lecturer concluded his subject by some instances of the risks attending exploration in Brittany. On ascending the mountain, Méné Hom, the party had their course tracked by a wolf, which, as they found, on their return to Chataulin, had attacked and lacerated a number of persons on the road between that town and the mountain. Eight persons were already reported, in a letter from Chataulin to the lecturer, to have died from hydrophobia from this attack, and not less than thirty head of horned cattle and one horse. The wolf was killed by a peasant, taken to the Prefecture, and dissected. On another occasion, after taking observations along the coast, in search for the Isle of Avalon, of Arthurian romance, the lecturer was arrested at his hotel at ten p.m., on a cold winter's night, and compelled to accompany a file of *gendarmes* to the Prefecture, where he underwent an hour's examination, from which his passport, containing a *visé* for each of the principal countries of Europe, alone extricated him. The result of this search was the culminating point of the lecture. Several writers were referred to who gave the matter up as hopeless, but the lecturer determined to visit successively every island along the coast of the Arthurian district, and closely inspect for himself. All the hand-books and local authorities were silent or unable to give information. At last an island was found on which was a remarkable dolmen, having round it a circle of stones, or, as the lecturer preferred to call it, a court, enclosed by an external peristalith, similar to that at Mycenæ, excavated by Dr. Schliemann. Local inquiry led to the discovery that an adjoining island was the traditionary Avalon (Isle of Apples), and on visiting it the inhabitants maintained that it was so. An investigation of the encroachments by the sea showed that the two islands were formerly one, and that consequently the dolmen once stood on the Isle of Avalon. The description agrees with that given of the position of the island by a writer of many years past; but the difficulty was, there were no trees, and, consequently, no apples.

In a close inspection of the island some very ancient stones, admitted, traditionally, to have been the apparatus for ancient cider-making, were found, and with them some stone celts, rubbing-stones, and other neolithic implements, —evidence, in short, that before the encroachments of the sea the island had its primitive cider-making, and consequently the apples for its production. An old and rude *bénitier*, dug up several feet under the surface near the dolmen, indicates that a primitive chapel must once have existed near the tomb of the Royal combatant for the Christian faith,—King Arthur? An enormous menhir, now sculptured with a great many Christian emblems, commands the two islands from the mainland, and two other large dolmens, not having the "peristalith," are on land to the east and west of Avalon. The name of the town in the district, Tregastel, *i.e.*, three castles, seems indicative of these three monuments, and near the town is a menhir, sculptured into the form of a serpent, supporting on its head a rude stone cross. The lecturer said he had purchased the estate on the island, and brought the lithic evidences of the cider-making, &c., with him to London for their security.

We give a view of the tomb. Without desiring to throw doubt on Dr. Phené's supposition, it is right to say that the occurrence of a dolmen (or cromlech) with a circle of stones around it is by no means unusual.

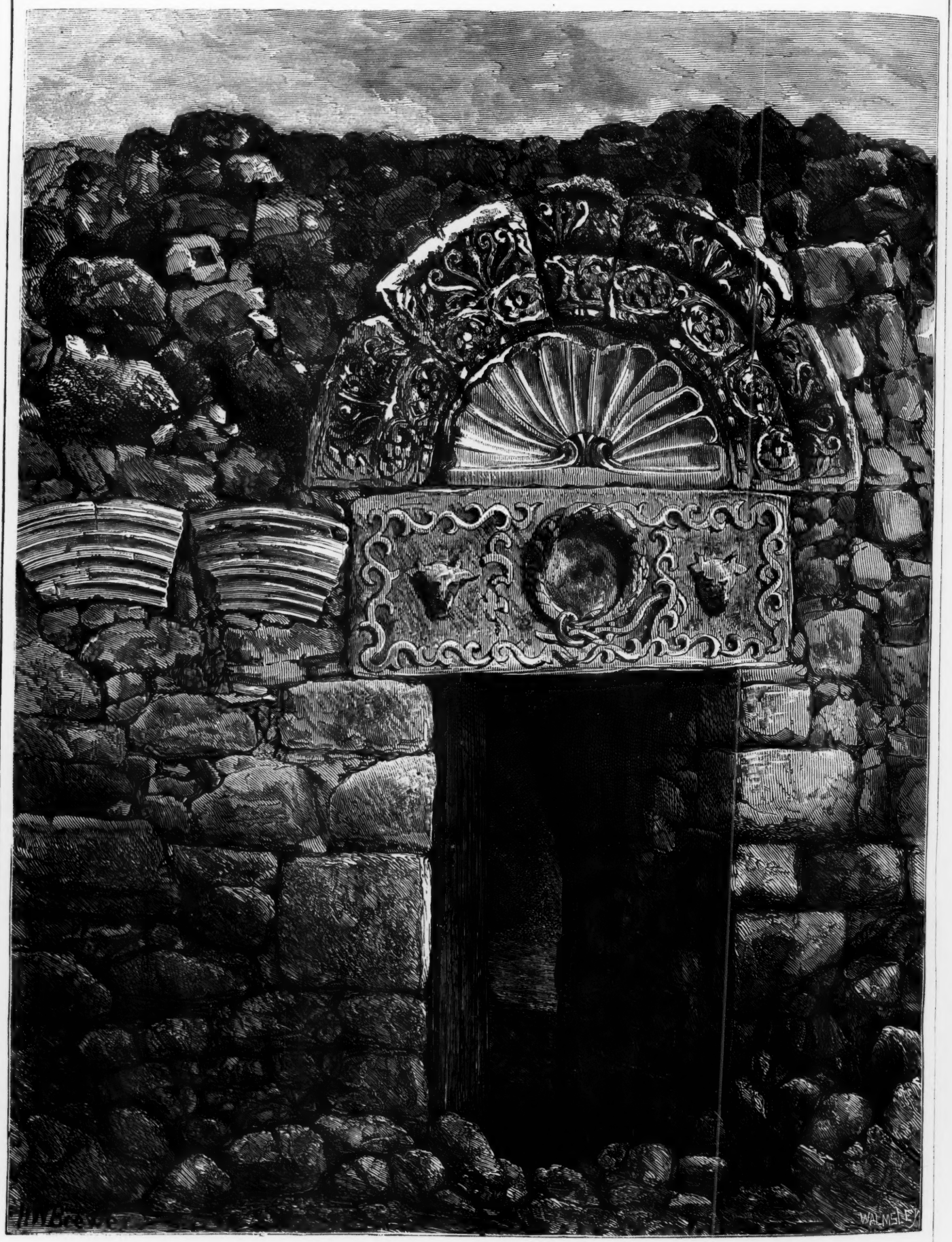
RECENTLY-DISCOVERED SYNAGOGUE AT SŮFSÂF.

THIS is one of the two newly-discovered synagogues found during the course of last year by the Palestine Exploration party while executing the survey of the northern portion of Palestine. These synagogues are peculiar to Galilee, none having been found in the south; they date from about 120 A.D, when Rabbi Simeon Bar Jochai built a great number of synagogues, notably those at Kefr-Birim, el Jish, and Meirûn.

The remains of the synagogue shown in the illustration, taken from a photograph by Lieut. Kitchener, R.E., consist of a sculptured lintel built in over the door of the modern Mosque of the village, and surmounted by a curved niche surrounded by ornamental voussoirs. The lintel measures 5 ft. long by 1 ft. 8 in. high, the voussoirs are 1 ft. 4 in. on the inner arc, and 1 ft. 9 in. on the outer, by 1 ft. 1 in. high.

It appears probable that this lintel formerly belonged to one of the smaller of the three doors common to these synagogues. The niche is placed over it, as it probably was in the original building, but the ornamented voussoirs evidently come from the larger doorway, as there are one or two lying about, and they do not fit round the niche. The probable voussoirs of this smaller doorway are shown in the illustration built into the wall on the left.

A curious feature in these synagogues is the prevalence of figured animals, contrary to the Jewish law, which forbade the representation of any animal forms. In the present instance two rams' heads are sculptured, one on either side of the central wreath of the lintel. At Kefr-Birim, on the two principal lintels of the synagogues rams are figured. At El-Jish, in the other newly-discovered synagogue, a stone bears the design of a Roman eagle. It is curious in this case to find the very emblem employed against the admission of which into the Temple at Jerusalem the Jews at an earlier period had so strenuously resisted. In the synagogue at Nebartein, on the base of one of the columns a hare is sculptured, although an unclean animal according to the law of Moses. In the synagogue at Umm-el-Amud, and probably at Irbid, lions occur on the lintels. All this seems to point to a change in Jewish customs, showing



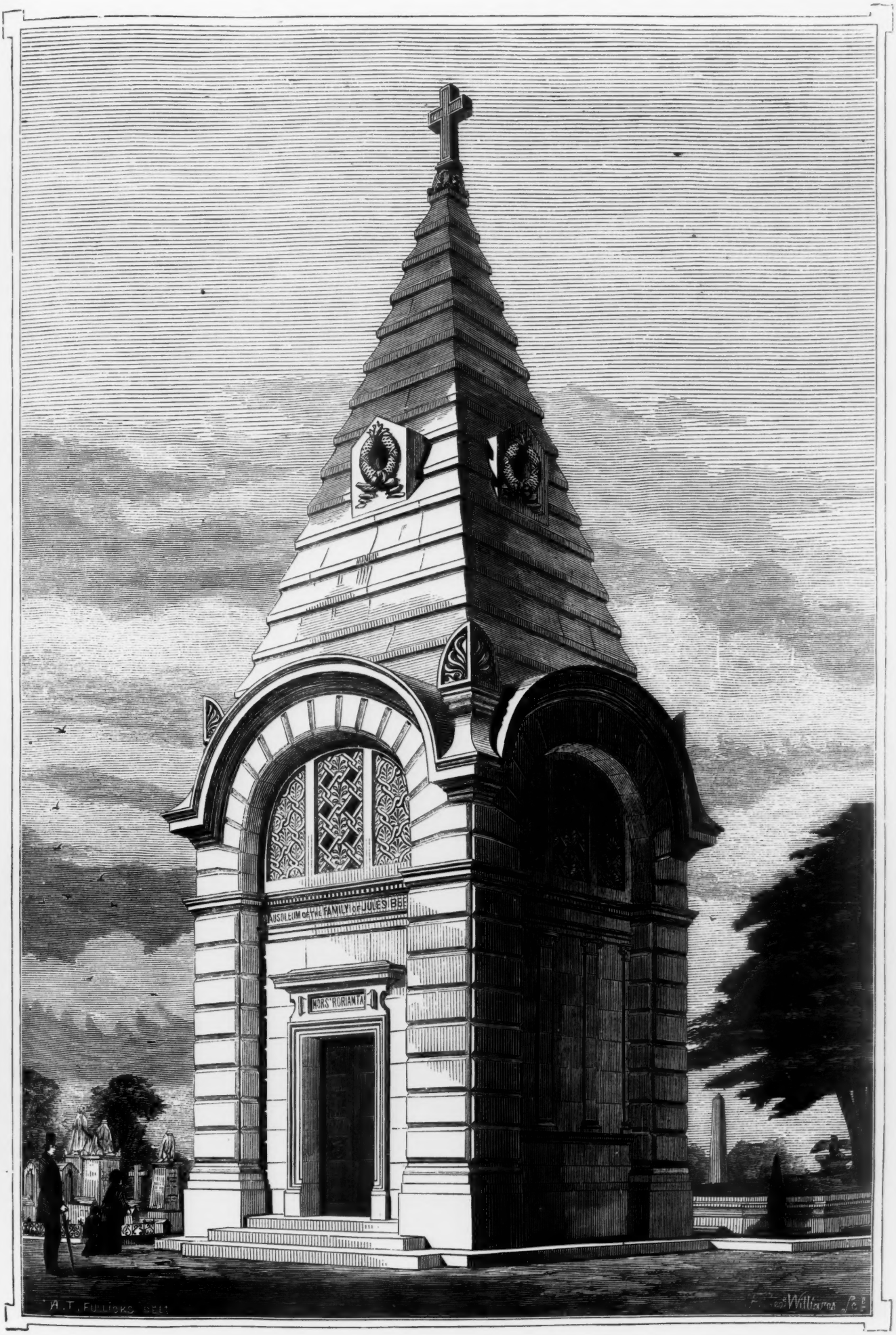
RECENTLY DISCOVERED SYNAGOGUE AT SŮFSÂF, IN PALESTINE.

Hellenistic influence, which agrees with and accounts for the architectural character of these remains.

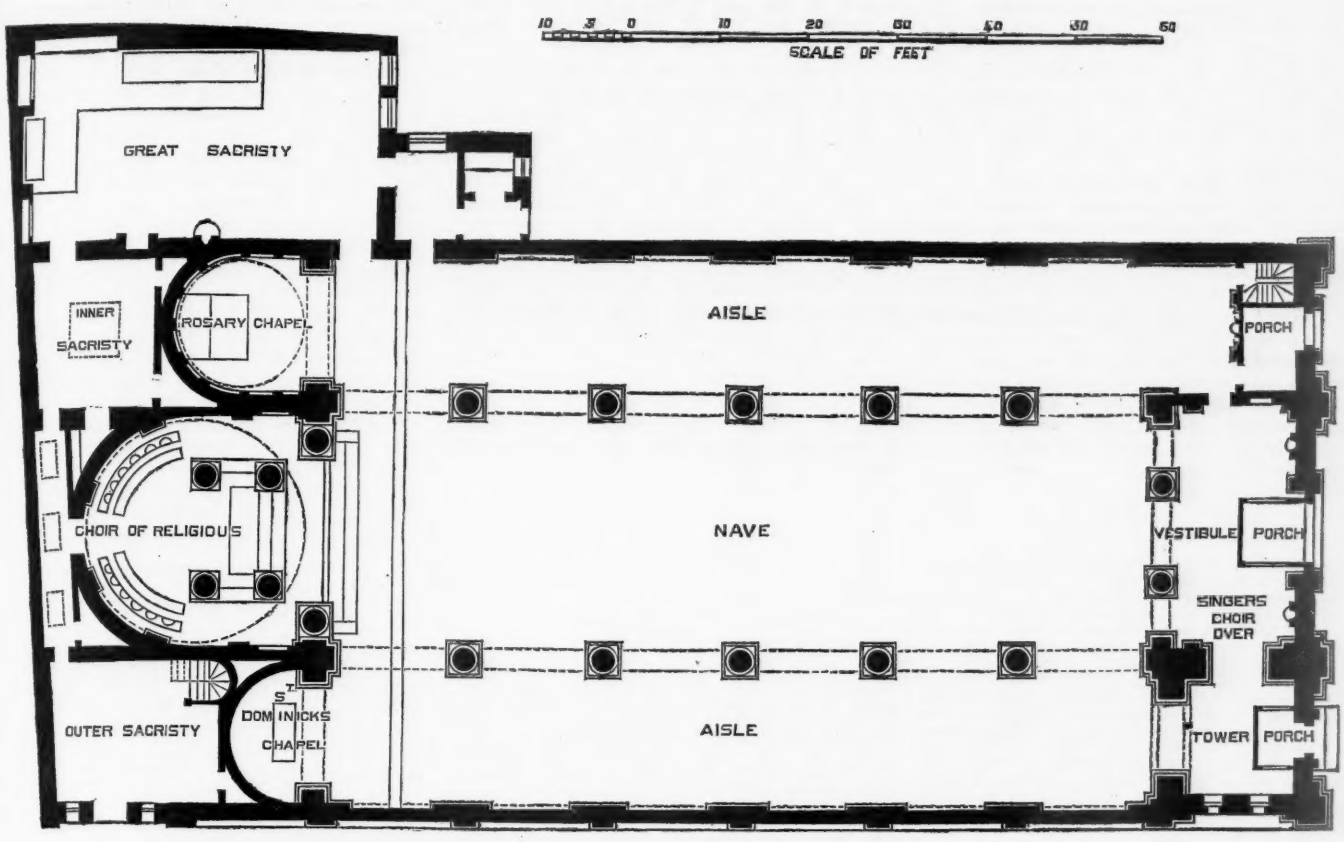
The general plan of these synagogues is well known, and has been already fully described by Major Wilson, R.E. The special features are the three or five aisles running north and south, with three doors to the south, one large and two small; the small inter-columniation of the pillars, and the peculiar double-corner columns.

THE BEER MAUSOLEUM, HIGHGATE CEMETERY.

This mausoleum has been erected for Mr. Julius Beer, from designs by Mr. John Oldrid Scott, architect, and is built of brown Portland stone, from Messrs. Giles's quarries. The crypt is entered from the lower catacombs. It is domed internally, the dome being covered by a pyramidal roof. The interior is intended to be inlaid with mosaics. The sculptures are from the studio of Mr. H. Hugh Armstead, A.R.A. Mr. Terry is employed to execute the marble sarcophagus. Messrs. Farmer & Brindley are the carvers and modellers of the bronze doors. The contractors are Messrs. C. Millward & Co., of Kentish Wharf. Mr. Thomas Leigh has acted as clerk of the works; and the cost is stated as about 5,000*l*.



THE BEER MAUSOLEUM, HIGHGATE CEMETERY.—MR. JOHN O. SCOTT, ARCHITECT.



ST. SAVIOUR'S CHURCH, WATERFORD, IRELAND.——*Plan.*

ST. SAVIOUR'S CHURCH, WATERFORD, IRELAND.

To the illustration of this church already published, with some descriptive particulars,* we now add a plan.

ARCHITECTURAL ORNAMENTATION.

ARCHITECTURAL ASSOCIATION.

AT the ordinary general meeting of this Association on Friday, the 10th inst., Mr. Bowes A. Paice, president, in the chair, a letter was read from Mr. George Gilbert Scott in acknowledgment of the vote of condolence sent by the Association to the family of the late Sir Gilbert Scott, and also thanking the Association for the part it took in connexion with the funeral.

Mr. Frederick Lees and Mr. Leonard B. Willoughby were elected members.

Votes of thanks were passed to his Grace the Archbishop of Canterbury for allowing the members to visit Lambeth Palace, and to Mr. J. P. Seddon for his kindness in conducting them over the building, as reported in last week's *Builder*, p. 481.

The President said he regretted to announce the death of Mr. H. Avern, one of the most energetic and promising members of the Association. He was articled to Mr. John Ladds, of Chapel-street, with whom he stayed seven or eight years, and by whom his services were much valued. He left there to go to Mr. Chancellor's, Finsbury-circus, where he had been for the last five years, latterly acting as managing assistant. He was a very hard worker, and long hours and too little exercise had told but too surely on his by-no-means vigorous constitution. He was enthusiastically fond of his profession, and worked energetically at anything he took up. He had won numerous prizes offered by or through the Association, and his loss would be much deplored by all who knew him.

It was announced that to-day (Saturday, the 18th) a visit would be paid to the New Law Courts.

Votes of thanks having been accorded to Mr. H. H. Stannus and the Entertainments Subcommittee, and to the "Whip Quartette," for services rendered in connexion with the members' *soirée* on the 26th ult.,

The President announced that, as the members of the Association were doubtless aware, the Biennial Conference of Architects was to take place from the 3rd to the 7th of June next, and as the Association had arranged to hold its closing ordinary meeting on the last-named date (when Mr. T. Roger Smith had consented to read a paper on "Prehistoric Art and Rude Stone Monuments"), he had been requested to ask permission of the members to allow that meeting to form part of the Conference programme.

No objection was offered to the adoption of this course.

It was announced that the next meeting of the Association would be held on the 24th inst., when the officers and committee for Session 1878-79 will be nominated, and Mr. Alexander Payne will read a paper descriptive of a trip "To Burgos and Back."

Mr. Hugh H. Stannus then proceeded to give a lecture "On Architectural Ornamentation." He remarked that some time ago he wrote an essay on "The Decorative Treatment of Constructive Ironwork," for the Institute Medal. In the course of that task he found that many of the laws or rules which governed the application of ornament to ironwork were equally good for the governance of all kinds of architectural ornament. The remarks he intended to make would have reference entirely to Classic art, and to its Roman and Italian presentments. He adopted that course, not from any want of appreciation of the beauties of Gothic art, which were many and various, but because Classic art was, if he might say so, his own vernacular. Old John Evelyn, in that delightfully quaint book of his, says:—

"Ornaments, however gay and fine they appear to the eye [and are in many cases very laudable and necessary], there is yet no small judgment required how and when to place them appositely, so that they do not detract, rather than add, to the beauty of the work. Now by ornament we understand whatsoever of sculpture and carving is not of constant use, or is not absolutely necessary, such as frutages, festoons, chaplets, wreaths, &c.; frets, guilloches, dentils; metops, triglyphs, cartouches; niches; statues, busts, relievos; pine-cones; urns."

Mr. Stannus said he intended to speak of architectural ornament properly so called, as distinguished from decorative work such as designs for wall-papers, curtain-stuffs, and other textile fabrics. He also limited his remarks to external architecture, because internally the question of mere decoration was apt to get mixed up with what was purely architectural. By architectural ornamentation, he meant any enrichment superadded to the constructive parts of a building. Such ornament was of two kinds, the symbolic and the æsthetic. By means of the former, the whole of a building could be covered with symbols which, if not exactly beautiful, spoke to the beholder of the purpose for which the building was erected. On the other hand, such symbolic ornament could be made to answer its purpose without palling on the sense of beauty, and would then be entitled to be considered æsthetic. The laws governing the application of architectural ornament were not all necessarily universal in their application. He divided those laws into two classes, the practical or technic, and the æsthetic. Amongst practical considerations, the position of the building, and the distance from the eye of the spectator of different parts of it, would determine the size and character of the ornament, the more honourable or important parts of the building being, where possible, emphasised by the character of the ornament. Then, again, the material in which the work was executed would demand consideration. For instance, marble, from its closeness of grain, would admit of a higher degree of finish than a coarser material, and its translucency was a quality which, when taken advantage of, was capable of conducing to incomparable effects. Weather or climate was another of the practical considerations which had to be borne in mind by the designer of architectural ornamentation. The construction or form of the ornament itself should be such as would not render any portions specially liable to breakage or damage, and economy of material should, of course, be studied. Among the æsthetic laws were these: That the ornament must be fit for the purposes of the building. It was self-evident that a building which was to be used for grave and solemn purposes should have ornament in keeping with its character, while a gay or festive building, such as an assembly-room, should be gaily and lightly ornamented. While the ornament should thus be fitted to the purpose of the building, it should also be fitted to its particular position in the building. Another important æsthetic law governing the use of architectural ornament was contrast in distribu-

* See pp. 378 and 381, *ante*.

tion. Ornament should not be frittered away all over a building, as in Indian architecture. The Indians spread a sort of delicate lace ornamentation all over their buildings, very beautiful, no doubt, in itself, but, notwithstanding the vast time and labour spent upon it, comparatively poor and miserable in effect. Another æsthetic law of ornament was what Mr. Ruskin called "principality," which consisted in making certain features more important than others. Other æsthetic laws governing ornament were symmetry, radiation, and parallelism,—these three being very important elements in architectural ornamentation; in fact, they constituted what was called "obedience" in ornamentation. When an ornament had to fulfil a certain duty in a particular place, it ought to acknowledge or recognise the shape of the position by which it was surrounded. Another important æsthetic principle which ought to be recognised in architectural ornament was growth upwards, —vigour, life. The last of the æsthetic principles governing architectural ornamentation was proportion, which could not be taught; everybody must acquire it for himself. Evelyn says further, on fitness:—

"The ancients, who spared nothing which might accomplish their public buildings, were not at all lavish in over-frequent and unnecessary gaieties. Their temples, amphitheatres, courts of justice, and other buildings of state, were grave and solid structures, void of those little membrets, trifling mouldings, and other superfluous carvings which take away from that majestic and grand manner that most becomes them; reserving those richer accessories and costly finishings for theatres, triumphal arches, historical columns, and other ostentatious pomps. Nor even in these did they use them promiscuously, but with great judgment, symbolical to the subjects and occasion. And therefore those ancient ornaments would not suit so properly with the ages since, and may, I conceive, lawfully be changed, without presumption: as if (for instance) instead of *sphinges* and *gryphons* placed before the Pagan temples (guardians of the treasure which was kept in those sacred buildings), *angels* should be set before our churches; and again:—in the friezes, instead of ox-sculls, dishes, and other sacrificing utensils, we changed them into cherubs, flaming hearts, books laid open, &c. The fronts of arsenals had antique helmets, shields, battle-axes, thunderbolts, &c., which we may answer with our modern artillery of cannon, bombs, trumpets, drums, &c."

Then Evelyn went on to make a valuable remark as to the size of these "properties," which, he said, should not be too far removed from natural size. Incidentally, Mr. Stannus remarked that young architects would find it a useful thing to keep a portfolio for such "properties and trophies," which were constantly being wanted. Proceeding with his lecture, Mr. Stannus observed that of the ornamented parts of a building there were the following five functional parts, viz., the dado, the base, the shaft, the capital, and the bracket. All these were features in ornament which had some work to do. There were four other ornamented parts not functional, and therefore receiving the highest kind of ornament, viz., the frieze, the panel, the border, and the moulding. The highest kind of ornament was never put upon functional members, but only upon such members as had nothing to do in the construction. Proceeding to illustrate the foregoing laws of ornamentation as applied to these several functional and non-functional features, Mr. Stannus omitted the dado and base for want of time, and proceeded to speak of the shaft or column. In his remarks on this head he deprecated the ordinary method of treating built-up columns, notwithstanding the example of the Greeks. He thought that a stone column, built up of a number of courses ought not to possess the unbroken lines of a monolithic column. However great the technical skill of our masons, we should not let such excellence of workmanship carry us away from true principles of design. The inconsistency of treating built-up columns in the usual way seemed to have been felt by Inigo Jones, for in designing the York Water Gate he had, instead of piling "cheese" upon "cheese," placed square and circular blocks of stone alternately in his columns, the result being, however, very clumsy and unsuccessful. Instead of building up columns in the usual way, with the usual fine joints, why not recognise the fact that a column was built up by acknowledging the joints by means of small rings or annulets? In that interesting period of architecture, the French Renaissance, when men were just breaking away from Gothic and were using up Italian features and details, gradually evolving the French château style, there were some interesting specimens of that mode of treating columns. Mr. Stannus said he believed that if we attempted to treat our columns in that manner we should be going along the path of progress. Passing on to speak of capitals, the lecturer confined his remarks to Corinthian caps, which, he said, were generally very unsatisfactory in the way in which they were treated by the moderns. Even Sir Christopher Wren's Corinthian caps were not satisfactory, and Wren failed in this respect from the same reason that other and lesser architects had failed,—because he took his Corinthian caps directly out of a book, and did not think out the subject for himself. Whenever Wren did think out a detail for himself it was good, but when, on the contrary, he took his details from a book, without modification, they were good, bad, or indifferent, as chance decreed. He (the lecturer) thought it was obvious that, when they immediately adjoined a plain shaft, the lower row of leaves in the Corinthian cap, they should be carved flatly, like "water-leaves," as the carvers called them, so as to break the violence of the contrast between the perfectly plain surface of the shaft and the highly-enriched carving of the upper part of the capital. A very objectionable feature in the Corinthian capital was its bell, which architects ought to make a vigorous effort to get rid of, as it was suggestive of nothing so much as the "compo" manufacturer, who, given the bell of the capital turned in wood, would apply the leaf-ornament, and soon turn out complete his compo imitation of the Corinthian cap. The retention of the bell gave to the ornament of carved Corinthian capitals a "stuck-on" appearance, and seeing that a Corinthian cap was very expensive to carve, it was not desirable that it should look like compo-work. In ornamenting a cap or any other functional member in architecture, the "ground" should not be visible beneath the ornament, which would otherwise inevitably look as if "stuck on." The "ground" might be shown in a frieze or panel, or other non-functional member, but in a functional member the carver should "lose the ground." Another objection to the bell of the Corinthian cap was, that it, being circular on plan, did not combine well with the abacus, which was rectangular on plan; in fact, the abacus, as seen in the Nelson column and elsewhere, seemed to be a thing by itself, instead of being an integral part of the cap. The projecting abacus was particularly unsightly, and in a cast for the caps of the Wellington Monument in St. Paul's the late Alfred Stevens had been very successful in getting over the difficulty, thereby proving, were any additional proof necessary, that architects were not obliged to copy the details of Classic architecture *verbatim et literatim*. What they ought to do was to take those details and reason them out before applying them to modern requirements, discarding altogether every bit for the employment of which a reason could not be given. Without venturing upon prophecy, the lecturer said he thought that Classic was coming up again to take its innings, and if so, it would be found that people would abandon all its useless features one after another, and thus prevent architecture from sinking so low as in the past. Having shown how the Romans debased the Corinthian cap, the lecturer treated of the modillion or bracket, which also suffered in Roman hands. In referring to the ornamentation of friezes and panels, the lecturer said it was highly important that such ornamentation should take cognisance of the axial lines of the building. The Arc de l'Étoile, Paris, was a very fine example of axiality in the lines of the repeating forms. As to parallelism, it was necessary, in such features as friezes, to have horizontal as well as vertical lines, and wherever possible the joints should be so arranged as not to clash with or mar the effect of the design. The podium of the Albert Memorial exhibited a glaring disregard of this rule. Among the figures was that of Phidias, holding up a statuette of Minerva, the joint in the marble coming right through the statuette, and in another figure the joint came through the elbow. Surely in a work of that kind, where there was no lack of expense, more care should have been taken to prevent such unsightliness. He did not say it was a proper thing to hide joints altogether, but they might be honestly shown and arranged without obtruding upon the beholder in so rough a manner as in the instance mentioned. Having dwelt at some length on mouldings and their enrichments, Mr. Stannus proceeded to speak of the importance of *reticence* in ornament, citing, as examples of the contrary method of fulness, the overdone or, as he called them, the "covered-all-over" works of the Romans. He recalled Ruskin's saying to the effect that were paints a guinea an ounce, people would be better colourists, and in the same connexion quoted Fergusson's remark, that if some Chancellor of the Exchequer would put a tax upon Classic columns and Gothic traceried windows and panels, people, being forced to abandon these, would be compelled to think out something else, and there would be progress in architecture. So, in like manner, the lecturer believed that if ornament were more expensive, — if a man were allowed to use only a limited number of architectural members in his façade, we should have more buildings which, like Baldassare Peruzzi's Farnesina Palace at Rome,—a gem amongst a lot of rubbish,—owed their success to *reticence* in the use of ornament. Having dismissed the question of "grammar and style," for want of time to deal with them, Mr. Stannus concluded a very interesting *viva-voce* lecture, our report of which is necessarily lacking in completeness, owing to the absence of the numerous sketches (on the blackboard) with which the lecturer aptly illustrated many of the points touched upon.

A brief discussion ensued, in which Messrs. H. L. Florence, Aston Webb, and W. Hilton Nash took part. To this we may return.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE annual meeting of this Association was held on the 7th inst., in the Old Castle, Newcastle, the president (Mr. T. Oliver) occupying the chair. Mr. J. W. Herring was elected an associate. The secretary (Mr. W. H. Dunn) read the annual report, which was the twentieth of the Association. The election of officers was then proceeded with, when Mr. T. Oliver was elected president; Mr. S. Oswald was elected vice-president; Mr. G. W. Hodge was re-elected hon. solicitor; Mr. M. Thompson, hon. treasurer; and Mr. W. H. Dunn, hon. secretary. A committee of ten members was also elected.

The President then delivered his address. He congratulated the Association in that during the hard times it not only held its own, but had made its way in the profession. In the death of Sir George Gilbert Scott they had to deplore the loss of the last honorary member of the Association. That class of membership had only numbered three members,—Grainger, Bonomi, and Scott. Each of these members was selected as special circumstances transpired, circumstances that rendered the event honourable to the Association and complimentary to the individual. The circumstance of Sir Gilbert Scott's election was that in connexion with his appointment as architect for the restoration of St. Nicholas's Church. In order to testify their appreciation of his great skill in church restoration, and to welcome him amongst them as a fellow-worker, and perhaps to some extent as a challenge to those critics who apprehended jealousy, they unanimously placed him in the category of honorary members, which was the highest compliment they as architects could pay him. He had the assurance from Mr. Scott's own lips, that their appreciation of his worth was as deeply felt on his part as on theirs. The history of a great man wrote itself upon those who observed him, whether through his works as works of art and skill, or through his writings. He was in that sense familiar with their late honorary member. He had addressed him (the speaker) by his architecture, by his literature, and by his presence. His architecture, speaking of his great works, was one,—one in feeling and style. It was not original, nor was it strictly eclectic, but it was always chaste, refined, and elevated. The Greek and the Roman form had no charm for him. He was the mental antithesis of Sir Christopher Wren. Pagan art was, in a sense, barbarous to Scott, as Gothic art was considered barbarous by Wren. Nevertheless, both were compelled by the force of circumstances to exercise their art in the department which they contemned. Barry, who designed the grandest Gothic building in the world,—the Palace of Westminster,—designed also the Reform Club and the Government Offices. Barry was eclectic. Scott, as by inspiration, seized hold of one idea, and held it to the day of his death. It was a beautiful idea,—so full of sentiment, and grace, and truth. It bordered on the holy; it was so sedate, severe, and reverential. It was the embodiment of mystic piety,—true poetry. Thirteenth-century Gothic architecture contained that idea. Like many other beautiful things, it had not been observed by others. He seized it with a

giant's grip, and it grew up under his care to perfection. Nearly the whole of the best of Gilbert Scott's works were Gothic. While other men were studying Vitruvius and Chambers, he was sketching the remains of our parish churches and bits of old cathedrals. Like a true artist, he had got hold of an idea, and he would work it out. His idea had to dislodge another idea, for then began the "battle of the styles." Gothic won the day, and the crown had been placed on Sir Gilbert's head. He had been requested to draw the attention of the members to another question. It was whether the municipality of Newcastle was justified in authorising its engineering officials to study and practise architecture. The town had no official architect. Indeed, he did not know of any provincial city or town that had one. They had engineers, however,—regular, thorough, properly-educated, and qualified engineers. He wished to ask them and the authorities whether it was possible to make an educated engineer an educated architect. If their engineers professed to be architects, whence did they get their education? If they were not thus educated, they could call such interference by the name that other professions did. The architecture of engineers was remarkable for one thing,—the absence of artistic feeling and effect. It was usually only brick and stone, and nothing more. There was no speech nor voice in it; nor could there be, for the simple reason that it was impossible to be a skilful engineer and an accomplished architect. The thoughts and ways and feelings, the youthful training, the after-thinking, and the practical carrying out of the works in those respective professions were inimical, and could not be blended in the ordinary man. Under these circumstances, he would advise that a special meeting be held for the purpose of considering the question in all its details. They could then decide upon taking such action as might seem to be necessary for the public benefit, and for the more public recognition of their acknowledged position as a profession. He then referred to the Architectural Conference to be held in London on the 3rd of next month, to which their Association usually sent two delegates. Mr. Oliver and Mr. S. Oswald were appointed delegates to attend the Conference.

TESTIMONIAL TO SIR HENRY COLE, K.C.B.

A MEETING of the subscribers was held on the 16th inst., at Grosvenor House, with the kind permission of his Grace the Duke of Westminster, who presided, for the purpose of making the presentation to Sir Henry Cole.

In opening the proceedings, the chairman said that five years ago a meeting was held at Willis's Rooms to take into consideration a proposal then made to offer to Sir Henry Cole some tangible recognition of his public services. Two years afterwards it was decided by the committee that the memorial should take the form of a mosaic portrait of Sir Henry, set in a tablet of Della Robbia ware, and of a bust to be executed by Mr. Boehm.

Mr. J. G. Crace, hon. secretary, laid before the meeting the results of the subscription, and the course which had been pursued. He said that the total amount of the subscriptions received was 2,924*l.* 13s. 4d. Every subscription promised, with one exception, had been received. The expenditure had been as follows:—For the manufacture of the mural monument, designed by Mr. Moody, 326*l.* 5s. 6d.; to Mr. Boehm, for the bust, 160*l.*; for advertisements, stationery, postages, &c., 200*l.*; to assistant secretaries, 31*l.* 10s.; 2,000*l.* had been paid over to Sir Henry; and there remained a balance in hand of about 200*l.*

The Duke of Westminster, in formally presenting the testimonial to Mr. Cole, expressed regret at the absence of Lord Granville, who of all others would most fittingly have discharged the duty. Those who knew anything of Sir Henry Cole's career knew how successfully he had worked for the promotion of science and art in this country, and what enormous results had accrued from his labours. The success, and indeed the very existence, of the South Kensington Museum was a striking testimony to the zeal and ability which he had displayed for so many years for the public good. The Chairman then asked Sir Henry Cole to accept the testimonial.

Sir Henry Cole acknowledged the presentation somewhat in the following words:—

I feel as though I am here to-day to receive judgment from a special jury, far too lenient to the faults and shortcomings of my life. But the forces of my nature have impelled me to do what has received this unusual and welcome mark of approval. My words can but feebly express my hearty thanks to the princes, peers, commoners, men of science, art, and literature, and handworkers, who have joined in this testimonial, and especially to the Duke of Westminster and the executive committee for their exertions. The testimonial connects my name with science and art and the South Kensington Museum, but let me say that the work done has been far less my own than the outcome of other sympathetic agencies. The origin and much of the progress of the Science and Art Department and erection of the Kensington Museum came from the Prince Consort, and after him they have been chiefly fostered by Earl Granville, who is the god-father of the name of South Kensington. More than twenty-five years ago, Mr. Henley, agreeing with Adam Smith's advice given 100 years before, enabled the carpenters and masons, and workers by rule in this county, for the first time, to learn the science and art of geometrical drawing. Twenty years ago the second Marquis of Salisbury started the present science system, and commenced the first permanent buildings of the Museum. Lord Granville largely advanced the buildings in 1859, being aided by Mr. Lowe, a most valiant defender of the South Kensington Museum at the time of his connexion with the Science and Art Department,—a time I look back to as that of *dies ambrosianæ* passed in the Board-room of the Institution. The Duke of Buckingham sanctioned the erection of the science schools and the great courts in 1866, and at this point the works have stood still since my retirement. It was by means of a co-operative system which used the various scientific and artistic powers available in the department,—the great constructive genius of Capt. Fowke; the decorative talent of Godfrey Sykes and his pupils, John Gamble and Reuben Townroe, students of unusual ability, trained in the Sheffield Art School; with the sagacious and learned criticism of the Art Director, Mr. Redgrave,—that successive Lord Presidents were induced to cause the buildings at South Kensington to be carried on, and many novelties in decorative art to be first introduced into England, but this system has been altered, and the works have stopped too. I have faith that the day may come when the system may be revived with further advantage to the public taste of the country, and enable the Government to promote the fine arts as Lord Beaconsfield desires to see. The State work of Art and then of Science has had to pass through many battles since it was started in 1852, but Parliament has never refused the necessary funds, which have increased nearly twenty-fold, whilst the number of students of different kinds and the visitors to the Kensington Museum and the allied institutions may be numbered by millions annually. The testimonial has in part taken the embodiment of a mosaic portrait, designed and directed by Mr. Moody, with a marble bust, sculptured by Mr. Boehm; and your executive committee have kindly asked me to suggest where they may be placed. In the Kensington Museum, a sort of chronological history is marked of the progress of the building during my time, by means of the mosaic portraits of the authorities, upon whose Parliamentary responsibility the work has proceeded. Upon the walls will be found portraits in mosaic (an art first introduced into this country) of Lord Sydenham, Lord Taunton, Mr. Henley, Viscount Cardwell, Lord Stanley of Alderney, Earl Granville, the Marquis of Salisbury, the Duke of Buckingham, the Duke of Marlborough, and the Marquis of Ripon. The portraits of Lord Aberdare and the Duke of Richmond have yet to be added. I hope I may properly ask that when the right time comes (perhaps when I return to mother earth) this testimonial portrait may be permitted to rest on the walls of the Museum as one who assisted in its creation. As respects the bust, by Mr. Boehm, after first ascertaining the views of the Prince of Wales, the president of the Royal Albert Hall, it was intended to be offered to that institution, together with a bust of Gen. Grey, copied by permission of the Queen. Without the personal exertions of Gen. Grey, I consider the Hall could not have been built. After fifty years of public life, with my health declining from the constant strain of official work, I felt it right to resign my duties. I am not idle in my leisure. My health has improved, and if Heaven be pleased to grant me life and strength a little longer, and with the cheering remembrance of your very great kindness, I hope to do still some useful public work on my own responsibility. I am trying to obtain a national recognition for music, the first and most popular of all fine arts; to help elementary education to become rather the work of the people than of the State; and to promote improved health throughout the country.

Lord Elcho moved the following resolution:—

"That the Mural Tablet in Della Robbia ware, containing the portrait in mosaic of Sir Henry Cole, shall be offered to the authorities of the South Kensington Museum as a record of the public services and the untiring energy of Sir H. Cole, and as a valuable product of British art-manufacture, with the earnest hope that it may be placed in some suitable situation in the Museum."

He said he had had the honour to be associated with Sir Henry Cole in many ways, and he could not speak too strongly of the great debt which the nation owed to that gentleman for his efforts in the promotion of art and science. Without detracting from the merit due to the late Prince Consort and to Lord Granville in connexion with the establishment of the South Kensington Museum, it could truly be said that the accomplishment of the work was mainly due to the administrative ability, tact, and good judgment of Sir Henry Cole. The energy and "go" that he possessed were well illustrated by the way in which, in a very short time, he succeeded in obtaining 120,000*l.* for the erection of the Albert Hall, as part of a scheme for the promotion of the study of the art of music.

Mr. Minton Campbell, in seconding the motion, spoke of Sir Henry's services in connexion with the promotion of industrial art, and of his aptitude for comprehending the technical conditions limiting the application of art to pottery, glass, iron, and other manufactures. His services in connexion with the Exhibition of 1851 were also alluded to as having benefited, not England alone, but the whole world.

The resolution having been adopted, Lord Clarence Paget moved,—

"That his Grace the Duke of Westminster be invited to present the marble Bust of Sir Henry Cole to H.R.H. the Prince of Wales, as President of the Royal Albert Hall, with the request that his Royal Highness will be graciously pleased to arrange for the same to be suitably placed in the Albert Hall."

His lordship more particularly alluded to the great services which Sir Henry had rendered in connexion with the Royal Albert Hall.

Mr. Godwin, in seconding the motion, adverted to the former resolution, and expressed the hope that immediate application would be made for consent to place the mural tablet in a prominent position in South Kensington Museum. It was at Sir Henry Cole's own request that a portion of the sum of money raised had been spent in works of art produced in this country. He might have received the whole of the money subscribed had he been so disposed. Even the cost of the bust of General Grey, which it was hoped would accompany that of Sir Henry Cole, had been defrayed out of the funds subscribed, because Sir Henry felt that if his own bust were to be placed in the Albert Hall, it should be accompanied by that of General Grey, and all who knew the history of the Albert Hall would agree as to the appropriateness of such an arrangement. The Della Robbia tablet was one of the largest and most successful specimens of the kind which had been produced in England, and would probably be the "fruitful parent of a hundred more." It was hardly possible that any official connected with the Government or with South Kensington could refuse a suitable position for it. As to Sir Henry's services in connexion with the Albert Hall, they had resulted in the provision, wholly by voluntary subscriptions, of a building suited not only for music, but for a variety of large and important gatherings; but no undertaking had been subjected to so much misrepresentation.

The motion was agreed to *nem. con.*

The meeting was also addressed by Macleod of Macleod, Sir S. Morton Peto, and Mr. Warren Delarue, the last-named gentleman remarking that the sum subscribed was not at all commensurate with the services which Sir Henry Cole had rendered.

Mr. Godwin, in moving a vote of thanks to the Chairman for the interest he had taken in the movement, took occasion to speak in appreciative terms of the untiring efforts of the hon. sec., Mr. J. G. Crace, to promote the success of the testimonial.

The Chairman, in responding, also expressed his sense of the obligations the subscribers were under to Mr. Crace.

INCRUSTATIONS ON BRICK WALLS.*

THE disfiguration of brick house-fronts by white incrustations is now so general that it is to the interest of the public, and of brick-makers and builders particularly, that its causes shall be determined and a remedy applied, so that, if possible, houses built hereafter may be free from it. Many recent attempts at ornamental brickwork have resulted only in unsightly walls. The incrustation has been variously discussed in the newspapers, but owing to conflicting views of its causes, builders, brick-makers, and bricklayers appear still to doubt the efficacy of any remedy hitherto proposed. It is desirable that all observed facts and statistics of attempted improvements should be collated and reviewed by some competent authority.

This defacement is most noticeable in dry weather on parts of walls subject to dampness, and on entire walls after rain-storms have soaked them. North and east walls are coated on drying after north-east storms. Chimney-walls and chimney-tops, lines of leaky or obstructed water-spouts, spaces beneath window-sills, walls near the pavement, and pavement-bricks, are specially marked. The white coating is derived primarily from both bricks and mortar, and in some cases it is difficult to decide, without dissecting the walls, whether the bricks, the mortar, or both, are or are not concerned. The Bankers and Brokers' building, opposite the Stock Exchange, is not yet completed, but its walls are already unsightly with white patches. The black mortar or cement with which they are pointed has disintegrated and crumbled out here and there, leading to the conclusion that this is chargeable with the defacement. The bricks, however, are coated where the pointing is not at all affected, and one particular brick, which was left out of the wall, and was faultless in form, colour, and consistency, showed white patches when it dried after having been wet.

It will be found most convenient to consider, first, the incrustration as derived originally from the bricks. It is most conspicuous on comparatively new walls. It may be observed in the outskirts of the city, on very new walls of unfinished houses in which no fires have burned, and where the mortar is unchanged. In these cases the white substance is dissolved by moisture from the bricks, which contain it before they are built into the houses. The writer has visited several brickyards in the suburbs, where piles of new bricks, which had never been in contact with mortar, but remained in a comparatively pure atmosphere since leaving the kilns, showed the common white incrustration. Some of the bricks which remained in the kiln were also coated. In several yards the incrustation had, here and there, a yellow tinge, possibly from traces of oxide of iron or hypo-sulphite of lime. One of these bricks, taken haphazard, was examined somewhat in detail. The white coating had a peculiar taste, in which that of sulphate of magnesia (Epsom salts), though disguised, was recognisable. As this white substance had come out from within the brick, the latter was crushed and the *débris* digested in water. At the end of a week the water had dissolved out a mixture, consisting mainly of the sulphates of magnesia, lime, and iron. This brick contained no traces of sulphites, soluble carbonites, or soluble chlorides. The white incrustration disfiguring several fine pressed bricks in a new wall was also examined. It had so saline a taste that most persons would have pronounced it common salt. Nevertheless it contained none. It was almost wholly sulphate of lime and magnesia, with traces of iron and alumina. No carbonates were present. Several other specimens of incrustation were examined, with the same results. Two specimens of incrustration were examined specially for soda and potassa, but neither contained noticeable quantities.

The fact being established that bricks burned with coal fires are impregnated with the soluble sulphates mentioned above, specimens of brick-clay from the pits of different brickyards were next examined, in order to determine whether, and to what extent, these salts originally exist in brick-clay, or are produced when bricks are burned with coal fires. None of the specimens contained free sulphuric acid or appreciable quantities of soluble sulphates (such as the sulphates of magnesia, lime, or alumina). They contained no soluble carbonate or chloride. Only minute quantities of insoluble carbonates (such as the carbonates of lime and magnesia) were present. Further examination proved that all the specimens consisted chiefly of clay proper, *i. e.*, silicate of alumina, with much oxide of iron, and small proportions of lime and magnesia, which, presumably, were also contained as silicates. The proportion of lime and magnesia contained in the clay,—separated by long digestion with an excess of hot sulphuric acid,—about equalled those existing as sulphates in the aqueous brick solution; suggesting the inference that brick-burning may, in some instances, convert all, or nearly all, the supposed silicates of magnesia and lime into sulphates.

The process of burning bricks with coal sufficiently accounts for this conversion. Nearly all coal contains diffused particles of sulphide of iron, or iron pyrites. These are decomposed when coal burns, and sulphurous acid gas is one of the products of the combustion. When sulphurous acid gas, air, moisture, and substances which have an affinity for sulphuric acid, are brought together at high temperatures, long sustained, sulphates of the susceptible substances are formed. The silicates of lime and magnesia are probably decomposed under these circumstances, sulphates of lime and magnesia being formed, while silica is liberated. It is, therefore, reasonable to suppose that when the dense, sulphurous vapours of a coal-burned brick-kiln, which are suffocating outside of it, are diffused, with moisture and air around and through the clay of intensely heated bricks for the greater part of a week, the fires being maintained usually three days, and the kilns opened at the end of a week, a reaction takes place; and that when the bricks are turned out from the kiln, they are impregnated with the above-named sulphates. When the bricks become wet, these compounds dissolve, and in dry weather, succeeding storms, the solution evaporating from the surface of the bricks leaves them coated with these white compounds.

Sulphate of magnesia possesses the peculiar property of efflorescing, or blossoming, in dry air. In this way a very small amount becomes conspicuous. Brick clays contain varying proportions of lime and magnesia, and the percentage of iron pyrites varies in different specimens of coal. Bricks may be noticed apparently overstocked with the sulphates of magnesia and lime. These are much whiter in dry weather than others surrounding them. Coal is now generally, if not universally, used here for brick burning in place of wood. Coal-dust is commonly mixed with brick-clay in clay-pits, and may add to the production of sulphates within the bricks. The white incrustation, however, occurs on bricks in yards where coal-dust is not mixed with the clay. It is not used in pressed bricks, and these are as frequently defaced as others. Common bricks, in back buildings, are coated with the white incrustation, but generally escape attention. Bricks least subjected to sulphurous vapours while burning, may be less impregnated with the sulphates of magnesia, &c., than others.

The simplest way to get rid of the sulphates, so far as the bricks supply them, is to avoid producing them while manufacturing the bricks. Pressed bricks, and others intended for ornamental purposes, might be burned with wood or with coke, if free from sulphur, in separate kilns, far away from places where coal is burned in considerable quantities. Unless afterwards exposed to an unusual amount of sulphurous vapour, they would probably undergo no change.*

It has been asserted that the white coating was formerly noticed on bricks burned with wood, but the evidence appears to be mostly the other way. It is quite possible, though, that a white efflorescence, derived from the mortar, may have been observed on old wood-burned bricks; or that such bricks, in rare instances, have been specially subjected to sulphurous vapours, and thus altered.

It has been suggested that the white incrustation results from chemical change effected in bricks by sulphuric acid vapours in the air,—derived from coal burned as fuel, and from the combustion of illuminating gas. If the gas is properly purified at the gasworks, little sulphuric acid can be traced to it. Much more is generated by burning coal in houses and factories, but it is at least doubtful if much change is effected by it in bricks, particularly after its diffusion, though there is no doubt of its effect, in time, upon mortar, as explained hereafter. We have seen that bricks now generally contain enough of the unwelcome sulphates before they are placed in walls, and that, in some instances, all the susceptible magnesia and lime in them are then already converted into sulphates. The small amount of sulphuric acid diffused in the air is insufficient to produce any effect until after long exposure, yet new bricks are more disfigured than old ones. Silicates of lime and magnesia in the semi-vitrified bricks are somewhat protected from the action of the air. It is questionable, on the principle of elective chemical affinity, whether these silicates, even if more exposed, would undergo decomposition in the presence of the more vulnerable mortar. Some bricks, however, may contain free lime and magnesia.* If the atmospheric acid vapours affected silicate of magnesia in bricks, serpentine stone fronts,—almost wholly silicate of magnesia,—would be much more affected. Many of these have been carefully examined, but in no case were the stones altered. Sometimes the thick lines of mortar between them being decomposed, solution of sulphates from these had washed over the stonework and defaced it.

Sulphate of magnesia is largely produced by the decomposition of mortar. Most of the lime used here is burnt from magnesian limestone, obtained in this vicinity, and the result is a mixture of lime and magnesia in varying proportions. The limestone belt of Chester Valley, which runs diagonally across the State, and which furnishes most of our lime, is largely magnesian limestone; the lower sub-division of the same formation in New Jersey being specially named the magnesian limestone in New Jersey geological reports. The mixture of lime and magnesia thus obtained, when slaked and made into mortar, is very susceptible to the influence of sulphurous fumes. These react, forming the sulphates of lime and magnesia. The great solubility of sulphate of magnesia facilitates its diffusion, and makes it the chief cause of defacement; sulphate of lime being comparatively insoluble. As the sulphate of magnesia dissolves and effloresces, the mortar is disintegrated. Sulphurous acid from coal burned in houses, produces its chief effects before it is diffused in the outer air. As it passes up through a chimney, it finds its way through crevices and pores in the wall, and thus directly attacks the mortar; sometimes causing the fall of chimneys, by eating out the mortar cementing them. The bricks, when damp, absorb sulphate of magnesia, or sulphate of magnesia and lime, from the altered mortar surrounding them. Sulphate of magnesia from altered mortar is most noticeable within doors, on chimney walls, and in cellars, where the damp mortar is directly subjected to sulphurous vapours. Efflorescent crystalline masses of sulphate of magnesia often accumulate and protrude from between the loosening bricks.

Dampness produces a solution, which is sometimes diffused through a brick and makes its appearance outside, while the outer lines of mortar bordering the brick remain intact.† Several soft bricks in the outer wall of a chimney-flue were examined recently. They were completely impregnated, as well as coated, with a white substance, which had disintegrated some of them, and which, on analysis, proved to be sulphate of magnesia, with traces of lime, alumina, and oxide of iron. Sometimes, after long exposure, the outer lines of mortar appear to be directly affected by sulphuric acid vapours diffused in the surrounding atmosphere. Delicate crystals and protuberances of sulphate of magnesia and washings from these were observed on mortar limes in brick and granite garden walls as well as on house fronts. Thick mortar lines in walls of brown stone buildings are much affected. Churches at Thirty-sixth and Chestnut streets, Eighteenth and Columbia avenue, and Franklin-street, near Brown, will serve as illustrations. The syenite retaining walls inclosing the Friends' Meeting House, at Seventeenth-street, and Girard-avenue, and those of the House of Refuge on Poplar-street, show the defacement. In all these cases,—particularly in the instances of the syenite walls,—sulphuric

* By Mr. William Trautwine, in the Journal of the Franklin Institute.

* Clay sometimes contains iron pyrites, and its decomposition results in the formation of sulphates. Such clay is, of course, unsuitable for bricks intended for house fronts.

* The writer does not assert that the magnesia and lime found by him in the clay specimens existed as silicates. This point was not determined, and is assumed only because no carbonates or sulphates of magnesia or lime were found in the clay.

† Bricks readily absorb solutions, such as those of common salt, soap, &c., and these substances appear on the surface when the solutions evaporate.

acid vapours clearly do not affect anything within the stones. In some cases mortar contains the sulphates of lime and magnesia before it is used. Most of our lime is burned with coal, and a half-dozen specimens of quick-lime from different lime-kilns yielded slight traces of the sulphates of lime and magnesia. If we accept the development of these traces of sulphates in the lime by coal-burning, mortar is probably made and used now about as it has been for many years past, excepting also that mud is sometimes used in place of mortar. Much more sulphuric acid, however, is now generated within the city limits, particularly in winter, by the greatly increased use of coal.*

To avoid this white defacement developed from mortar, builders should use lime free from magnesia in erecting exposed brickwork. A demand for such lime will bring ample supplies from other localities, and at low prices.

Continuous exposure to sulphurous vapours may effect some change even in mortar made from lime containing no magnesia. But, as before stated, the great solubility of sulphate of magnesia, and its tendency to effloresce, make it the chief evil, and it is worth while to try the result of using purer lime.

When argillaceous limestone is burned, hydraulic cement is formed. The resulting mixture of lime and burned clay (usually with some sand), when wet, "sets" compactly, and the admixture of clay may, to some extent, protect the lime from such influences as might otherwise affect it injuriously. Portland (hydraulic) cement is made by burning an artificial mixture of limestone (chalk) and clay. Portland cement is believed to contain but a small proportion of magnesia, and this circumstance, in connexion with that of the possible protective influence of the clay, justifies the supposition that walls built with this cement may show less white defacement than those in which our ordinary mortar is used. Several brown stone base-walls, laid in good cement, and particularly exposed to dampness, were examined, but showed no defacement. The painted walls of a room in the building of one of the trust companies in this city, lately became much disfigured by the formation of efflorescent crusts of sulphate of magnesia and lime, from the decomposition of mortar within the walls. At the writer's suggestion, hydraulic cement was substituted for the mortar, and the walls repainted. This has since remained unaffected. Cements vary in price and quality, from good to worthless.† Chimneys might be laid in cement, and if white markings between the bricks are desired these can be painted or pointed with marble-dust. This is nearly pure carbonate of lime, and is used in mortar for pointing. It appears to remain a long while unaffected, indicating that sulphuric acid vapours in the air exert little influence upon it. Plaster (sulphate of lime) is not generally used for pointing. Unless largely mixed with mortar it would crack off or be dissolved, and washed by rain over the bricks. Paint serves to some extent as a protection from dampness. The disfigurement may, however, be observed occasionally on painted brick walls after damp weather, the paint being discoloured, and in some cases thrown off by the incrustation forming beneath it.

The unsightliness caused by the white incrustations is intensified by contrast with what may be termed the black streaks. On almost every brick house these hang repulsively at either end of each window-sill. They represent the repeated washings of dust and dirt from window-spaces and window-frames. Scrubbing-brushes, vigorously applied, might remove them. Any simple device would serve to divert the dirty drippings which soak the bricks beneath the windows, developing characteristic white patches here between the black streaks. As it is, the model Philadelphia brick house, with its white incrustations and black streaks, is a reproach and shame. Builders and brick manufacturers who prevent these evils in new houses, may reasonably expect to reap public gratitude, and, perhaps, something more satisfying. Entire blocks of houses have so changed countenance,—have "so gone down,"—within a single year, as to repel desirable tenants, when, indeed, they remained in all other respects unchanged. The subject under consideration has for a long time interested the writer from a utilitarian standpoint, rather than a scientific one.

* Rain absorbs acid vapours contained in the air through which it falls, and driving rains from the north-east may thus acidify, as well as moisten, north and east walls.

† White efflorescences, chiefly of the carbonates of soda and potassa, sometimes disfigure walls built with cement mortar. Rosendale cements frequently contain a large per-centage of magnesia, together with soda and potassa. (*Vide* Gillmore on "Limes, Hydraulic Cements, and Mortars," N. Y., 1863.)

VENTILATION OF PUBLIC BUILDINGS.

SIR,—Your correspondent "G." may rest assured that Mr. Hood is quite right in questioning the statement in the *Times* that carbonic acid, the main vitiating substance of ordinary air, is always to be found at the bottom rather than at the top of an inhabited room, and that the inlets for fresh air should in consequence be at the top, and the outlets at the lower part of all well-ventilated apartments.

The result of experiments on the subject, both in this country and abroad, prove, on the contrary, that no such rule exists, and a similar conclusion must result from a consideration of the condition under which all gases are contained in the atmosphere.

The following are the results of determinations made by Professor Pettenkofer in the wards of a Lying-in Hospital at Munich, and they show the amount of carbonic acid in 100 parts of air collected at a short distance from the floors and ceilings of various wards:—

Ward containing twenty-six patients and without ventilation:—

		Carbonic acid.
From air	12 in. below ceiling	·269
Do.	do.	·263
Do.	12 in. above floor	·220
Do.	do.	·224
Do.	near an inner wall	·227

Ward containing five women and children, with ventilation:—

		Carbonic acid.
From air	2 in. below ceiling	·068
Do.	do.	·074
Do.	6 in. above floor	·038
Do.	do.	·039

Another ventilated ward:—

From air	12 in. below ceiling	·071
Do.	12 in. above floor	·039

Another unventilated ward:—

From air	12 in. below ceiling	·266
Do.	12 in. above floor	·224

Similar experiments were made by Professor Roscoe in England with the following results. In a small room having a capacity of 950 cubic feet, inhabited by a costermonger's family of nine persons, the chimney draught from a small fire and other accidental sources being the only means of ventilation:—

		Carbonic acid.
From air	6 in. below ceiling	·1213
Do.	2 ft. 6 in. above floor...	·1276

In a crowded schoolroom, having a capacity of 4,640 cubic feet, and containing seventy boys:—

		Carbonic acid.
From air	6 in. below ceiling.....	·3305
Do.	3 ft. above floor.....	·3253
Do.	6 in. below ceiling.....	·2390
Do.	2 ft. 6 in. above floor...	·2459

In a large schoolroom, having a capacity of 22,140 cubic feet, and after having been occupied for two hours, being imperfectly ventilated from a stove flue and other accidental sources:—

		Carbonic acid.
Air from	6 in. below ceiling.....	·2696
Do.	3 ft. above floor	·2948

At Wellington Barracks, in a room containing twenty men, and having a capacity of 7,920 cubic feet, supplied with an Arnott's stove and ventilator, both flue and ventilator being fully open, and the fire nearly out:—

		Carbonic acid.
Air from	3 in. below ceiling.....	·1382
Do.	2 ft. 6 in. above floor...	·1684

In a "fashionable theatre," when quite full:—

		Carbonic acid.
Air from	34 ft. above the level of stage, and over the stalls	·2637
Do.	4 ft. above do.	·3212

It will be found, by averaging these results (the only ones I know to have been published), that the quantity of carbonic acid at the lower part of the chambers experimented upon was slightly smaller than that at the top, the exact proportion being as 1 to 1·042. The average difference was no more, in fact, than is often found to exist where two or more determinations are taken at the same moment from any one spot, and when such difference would simply arise from unavoidable imperfection in the apparatus used for experimenting.

We may therefore assume that, though under certain conditions the quantity of carbonic acid in any two distinct volumes of air may differ, yet that in ordinary inhabited rooms no one portion can be certainly stated to contain more or less of this deleterious gas than any other portion.

The above result would necessarily follow a consideration of the laws under which gases and all other fluids have their existence. These laws, though in themselves simple, are, in their combination, and when considered in reference to the question of ventilation, somewhat complex; and from this arises, I presume, the difficulty which scientific writers seem to experience in their endeavours to clearly indicate what are the conditions under which a mass of air in an inhabited space can be dealt with so as to best maintain the nearest approach to purity.

Most people who have inquired into the science of ventilation are satisfied to have discovered the two very important facts that the principal deleterious gases of the atmosphere are heavier than the vital gases, and also that all gases when heated will ascend, and when cooled will descend. Their attention is not called to the equally important facts to be derived from studying the laws which govern the diffusion and transpiration of fluids, all of which laws are actively at work in causing what appear to them anomalous results.

It is, however, much to be regretted that the gentleman who of late years has had the editing of the articles appearing in the *Times* on the subject of ventilation should not make himself more fully acquainted with the chemical and physical properties of our atmosphere; for although, as Mr. Hood has pointed out, some of the statements bear their own refutation, yet the casual reader is too apt to imbibe false notions as to this all-important subject, and the more so that such errors are not suspected to exist in a journal of so high a class.

H. SAXON SNELL.

SIR,—A correspondent in your impression of the 4th inst. appears to be puzzled on the question as to whether carbonic acid, in ill-ventilated rooms, is to be sought for at the floor or at the ceiling. This question was definitely set at rest more than twenty years ago by some experiments undertaken by the Commission appointed to report on the ventilation of barrack-rooms and other buildings, and published by order of the House of Commons in a Blue Book dated August, 1857. These experiments showed that more carbonic acid gas always existed at the ceiling than at any lower part of the room, by a very appreciable amount. It was further found to be impossible to retain carbonic acid gas beyond a certain limited amount in any room, however accurately every aperture was closed. Those who understand the laws of the diffusion of gases will readily comprehend this. Experiments were made by mixing or diffusing a certain percentage of carbonic acid gas with the air of a large room. At the end of thirty minutes (every aperture being closed), it was found that the quantity of carbonic acid was reduced four-sevenths of its whole quantity, and this experiment was repeated in various forms, with the same result.

In addition to these experiments made by order of the Parliamentary Commission, independent experiments were made at the same time by Professor Pettenkofer, of Munich, nearly in the same form, and with precisely the same results. The question, therefore, has long been considered beyond dispute; and it is a mere waste of time to inquire whether ventilation should be by upward or by downward extraction.

C. H.

Memorial of the Late Lord Boston.—The tenants of the late Lord Boston have recently placed a stained-glass window in the east end of the parish church of Llanidan, Isle of Anglesea, as a memorial of his lordship. The window, consisting of three lights of lancet-form, is filled with mosaic glass, with medallions containing subjects. The three principal panels contain figures emblematic of the three Christian virtues,—Faith, Hope, and Charity; each figure having a smaller group in its light, exemplifying the practice of each respective virtue. Along the base runs an English and Welsh memorial inscription. The window was executed by Messrs. Heaton, Butler, & Bayne.

LIVERPOOL ENGINEERING SOCIETY.

THIS Society held its usual fortnightly meeting on Wednesday, the 8th inst., at the Royal Institution, Colquitt-street. Mr. M. E. Yeatman, M.A., vice-president, reported to the Society on M. Balpaire's method of calculating the resistance of arched structures. The Honorary Secretary stated that the council had considered the proposal to visit works of interest in the neigh bourhood of Liverpool during the summer, and that the first visit would be to the North Extension Railway Works.

Mr. L. M. Kortright, through the secretary, replied to the discussion on his paper on "Raising the wreck *Edith* in Holyhead Harbour," after which Mr. Alfred Holt, M. Inst. C.E., read a paper on "The Progress of Steam Shipping during the last quarter of a Century," previously read before the Institution of Civil Engineers.

BUCKINGHAM WATER GATE.

SIR,—With reference to this relic of Old London, I have myself taken some pains in endeavouring to rescue it from its present degraded state, but up to the present without success. It is private property, the owners setting an exaggerated pecuniary value upon it, though I think this may be modified, from communications I have had with a representative of the owners. Every one will, however, agree that it ought not to be left any longer as it is, now that public notice has been called to it.

Two ways suggest themselves—one, to excavate the land around the gate, and to leave it open to its base, showing the old steps and foreshore, and utilising it as an adjunct to the adjoining gardens; another, more utilitarian, would be to raise it bodily to the level of the gardens, forming an entrance through it from Buckingham-street, but so as not to interfere with the present terrace, which is a private promenade.

With the contemplated prolongation of Villiers-street to the Embankment, and the consequent pushing westward of the District Railway Station, the suggested thoroughfare would be a boon to the neighbourhood, and open up a direct access from the Strand to the gardens.

The Metropolitan and District Boards of Works are, no doubt, the proper authorities to deal with the matter, and with the cordial sympathy and co-operation of the committee of the Royal Institute of British Architects for the conservation of ancient monuments, Sir John Lubbock, and others, it ought to be speedily accomplished.

ROBERT J. WITHERS.

MISTAKEN IDENTITY: OAK OR CHESTNUT.

SIR,—As it fortunately happens that the discussion on my paper will not be taken till the 20th inst., the letters of your correspondents may lead to some useful additional matter against that day. I venture to think, however, that the writers do not show that amount of information on the history of this question which might have been expected. Premising that the subject was originally intended to occupy only one-half of an evening, and that the paper was therefore short, I may say that I should never undertake to give a full account of the whole controversy, much of which is embodied in Mr. Papworth's paper, and is, besides, notorious amongst those who have given any attention to the matter.

Mr. Britton, who offers no evidence of his own, speaks of the Westminster Hall roof in a way that makes me ask whether a question can ever be settled by any amount of evidence. His own authority, Tredgold, was actually one of the committee appointed by the Horticultural Society to determine the question of what wood was the roof of Westminster Hall really built; and with Atkinson, the well-known architect, Donald Beaton the gardener, Dr. Lindley, and other qualified persons, reported that it was of *sessiliflora* oak. Having seen several well-authenticated specimens of the wood, one or more of which are at the Institute, I shall certainly leave further examination of this roof to those who think they can find evidence in it to favour the chestnut theory.

As to Eltham Palace, the only evidence I know of its being chestnut is that alluded to by Mr. Britton. But the letterpress accompanying the engraving contains a footnote to the effect that during the late repairs some had said the roof was of oak, and others thought it to be chestnut, a matter which was difficult of determination. I know nothing of A. Pugin's qualification to judge between oak and chestnut, but if he felt sure that the ribs were chestnut why did he allow that note to appear? At all events, here is an opportunity for any one who will try to establish a case of a chestnut roof to examine this one.

Mr. Britton implies that there is little use in looking at specimens of oak and chestnut on the table of the Institute, but I maintain that such an examination of authenticated specimens is an essential preliminary to a judgment on any roof that may be in question. It is a remarkable fact that none of your correspondents notice the test which I have given, by which any piece of oak,—even if no larger than a cubic inch,—can with certainty be identified, and which can be easily applied to the old timbers of a roof. If this test is worthless, nothing can be easier than to prove it to be so; but if it is a true test, it is useless to talk of the difficulty of judging, and to apply such tests as that of a wet saw, which is probably of as little value as the driving of iron nails, which, in the discussion on Mr. Papworth's paper, was said to be inconclusive.

I gave no opinion of a clerk of works,—I produced his specimens, and I produced my own. If any person will exhibit authentic examples of either wood, and show that he has studied the subject, I am sure they will be welcomed by the members of the Institute, any of whom, like myself, will facilitate their exhibition.

I should be particularly glad to see exhibited one or two of the chestnut panels alluded to by "N.," though they do not affect the question. They would, however, serve to show the utility of the wood for internal decorations, or for furniture, as to which I have no doubt.

THOS. BLASHILL.

P.S. There are persons who seem to think that it is incumbent on any one who disputes the use of chestnut in old roofs to disprove every case in which its occurrence has been asserted. Surely, it is the business of those who make such assertions to establish their truth. At any rate, there must be a period in such a discussion when the erroneous statements of old writers have been sufficiently notorious, and their ignorance of the matter so patent, that one is bound to doubt their evidence till it is confirmed by fresh examination made with the full knowledge which we now possess.

PARIS DRAINAGE.

SIR,—In your issue of the 27th ult., p. 435, Mr. David MacGibbon, in writing upon the ventilation of sewers, alludes to the drainage of Paris, of which he appears to desire some more particular account. The twenty-fourth volume of the Minutes of the Proceedings of the Institution of Civil Engineers contains "An Account of the Drainage of Paris," by H. B. Hederstedt, Assoc.Inst.C.E., in which is very much information of a practical character, but little or nothing upon the particular point of ventilation, directly; indirectly it may be seen that the sewer gases can find vent.

But the Paris sewers do not generate gases of the character Mr. MacGibbon writes of, for what we call "night soil" is not admitted to them, but only rainfall and household water, and the contents of a comparatively small number of public urinals.

The Paris sewers came to mind as I was reading the leading article in your previous number of the *Builder* upon "The Structural Provision for the Discharge of the Rainfall of London."

The volume to which I have referred contains also a paper "On the Main Drainage of London and the Interception of the Sewage from the river Thames," by Joseph William Bazalgette, M. Inst. C.E. The first paper was read on the 7th, and the second on the 14th of March, 1865, and the two were discussed together.

I will not attempt to improve upon so much that has been ably written lately upon the question of deposit of solid matters at or near the outfalls of our London sewers; but it would appear that great expense is incurred in dredging and removing the deposits near the outfalls of the Paris sewers which discharge into the Seine,—which is not, be it remembered, a tidal river at Paris. At the date of the paper I refer to it is said,—"The maintenance of the system is most expensive, having amounted during a recent year to about 30,000*l.*, including the pay of one inspector, two office assistants, twenty general superintending conductors, and the labour of four hundred workmen employed in dredging the Seine, and in removing the deposit by carts and barges, as well as for tools and stores."

I think Mr. MacGibbon will find that much more has been done than he supposes in systematic ventilation of sewers in towns. In vol. 22 of the Proceedings of the Institution of Civil Engineers he will find interesting discussion and description in and resulting from papers read in February, 1863, upon the drainage of Dundee by J. Fulton, and of Newport by A. Williams.

JOHN HENDERSON PORTER.

ST. PAUL'S CATHEDRAL.

A WONDROUS improvement has been effected in the western frontage to Ludgate-hill by the opening out of the old inclosure in a semicircular plateau to Queen Anne's statue, and by the sale to the public of more than half the area formerly enclosed by a massive iron fence, 6 ft. high, surmounted upon a wall 4 ft. high, which impeded the pedestrians' view of the building at its base.

The new plateau is bounded most tastefully by short polished granite pillars, which sufficiently protect the enclosure, and at the same time open out an enlarged route for both mercantile traffic and foot-passengers.

To complete the work, and to give dignity to the noble structure, the clearance of the north and south sides from the western end to the central portals still remains to be carried out. On these sides there are but narrow strips of ground never used for interments, but still enclosed by those obscene iron barriers. If these were removed, and the plateau, with polished granite pillars, continued from the western angles, the surplus ground being thrown out for public user, then the integrity of the whole would be assured, whilst a sense of enlargement, both from within and without, would add grace to the structure of which all Britons are proud.

Placed in the great commercial centre of the metropolis, the principal arterial thoroughfare, by Fleet-street, Ludgate-hill, and the Poultry, to the Bank, instead of taking the direct route on the north side, has to make a detour around the south and east sides, involving an increased distance of 160 yards, besides the awkward return at a right angle by St. Paul's School to Cheapside!

At present there is a main driftway along the north side, 40 ft. wide from the entrance at Ludgate-hill to near the Chapter-house, where it is narrowed to 12 ft., and here there is a fixed bar, whence to the Poultry the driftway is but 18 ft., the paved footway having throughout a main width of 12 ft.

Now, the narrowest part of the enclosed churchyard is at the circular steps of the north portico, where there are still 28 ft. clear to the iron railings; and, as the churchyard extends from the portico towards the Poultry and St. Paul's School, there need be only about 30 ft. to 36 ft. of the old cemetery cut off, and thrown into a public causeway, to make the most utilitarian and important improvement of the day.

The roadway should be timber-paved, so as to assure quietude to both cathedral and shops, and a sufficiently wide paved footway reserved also on the church side.

Such a change as this would impart dignity with an aspect of unity to our illustrious cathedral, which, as viewed from the new causeway, would impress all beholders with the merits of the work, and a due appreciation of its great architect.

As to the old railing round the churchyard, it might still remain *in situ*, and the portion between the north portal and the Poultry (say about 80 yards) might be reconstructed, as a continuous and appropriate boundary.

QUONDAM.

Value of Land in the Northern Suburbs. As illustrating the rise in the value of land in the northern suburbs of London, it may be mentioned that a plot of land opposite the Finsbury Park Railway Station, containing about 27,000 square feet, was recently sold by auction by Messrs. Prickett, Venables, & Co. for 9,000*l.*

THE WIDENING OF CHEAPSIDE, AND MERCERS' CHAPEL.

THE widening and improving of Cheapside and the Poultry, between Old Jewry and Ironmonger-lane, will involve the demolition of the ornamental entrance to Mercers' Chapel from Cheapside, including the carving and sculpture on the face of the elevation, along with the several houses and shops on the east and west side of the chapel entrance. The materials of these buildings, consisting of eight houses and shops, in addition to the chapel frontage, were sold lately, and during the last few days workmen have been busily engaged in demolishing the premises, preparatory to the erection of new buildings on the site, the frontages of which will be set back northwards varying in distance from 8 ft. to about 12 ft. We understand, however, that for the present the elevation to the chapel will not be disturbed, but that when taken down it will be re-erected at a depth of about 9 ft. backwards.

THE POPULATION OF THE WORLD.

VERY loose and erroneous notions as to the number of the human race are by no means rare in general society, and even experienced writers, who commence leading articles with the well-worn phrase attributing to "every schoolboy" a knowledge possessed as a matter of fact by few men, are themselves often woefully at fault on the question as to the total population of the world. It is very common to find the number put down approximately at a thousand millions, but this cannot be justly called even a rough approximation to the actual figures. The ignorance prevailing on the subject is the less excusable, as estimates made by the highest statistical authorities on various occasions of late years have conclusively shown that the common impression about the matter is altogether mistaken, or, to say the least, is centuries out of date and obsolete. A few years ago, at the instigation of the International Congress of Statisticians at St. Petersburg, Dr. E. Berg found the population of Europe, according to the latest enumerations and estimates, to be upwards of 300 millions; and as there are 700 millions in China and India, it follows that there are 1,000 millions in Europe, China, and India alone, independently of all the rest of the world. The latest estimate of the world's population is that made by Messrs. Behm and Wagner, and published in Dr. Petermann's *Geographical Magazine*. According to these authorities the total number of the human race at the present time is between *fourteen* and *fifteen* hundred millions. As regards the population of the different quarters of the globe, these gentlemen show that Europe is now inhabited by rather more than 309 millions of people. Asia has more inhabitants than all the rest of the world put together, the estimated number of its population being set down at 824½ millions. As to Africa the observations of modern explorers show that its population was till recently very greatly under-estimated, and, according to the best authorities, its inhabitants cannot be now put down at less than 200 millions. The population of America, which, next to Europe, is the best ascertained by official enumerations or censuses, is at present not less than 85½ millions, and is more rapidly increasing than any other quarter of the globe. Finally, Australia and the Islands of the Pacific, or Polynesia, as they are sometimes collectively called, are estimated to contain rather less than five millions of people. Adding these several totals together, we arrive at the result that the present population of the globe amounts to nearly fourteen hundred and twenty-four (1,424) millions, or nearly half as many again as is commonly taken for granted.

Turning for a moment to the principal States of the world, we find that, next to China, with its 400 and odd millions, by far the most populous empire on the face of the earth is the British. Its total population is upwards of 236 millions. This is without reckoning the native states or protected principalities of India. The British empire contains nearly three times the population of the Russian, which has the next largest population, 86½ millions. The Turkish empire, as constituted previously to the late war, contained 48½ millions. Next come Germany and France, with 42 millions each, the Germans being Europeans, while of the French population, 5 millions belong to the colonies. The United States has a population nearly equal to that of Germany or France; while Austria numbers not quite 38 millions, and Italy about 27½ millions. It is interesting to notice that, according to the estimate of M. Vladimir Jackschitj, chief of the Servian statistical department, the inhabitants of Turkey in Europe number altogether a little more than 15 millions. Of these he estimates that 5 millions are in Roumania, 1,400,000 in Servia, 190,000 in Montenegro, and 8,500,000 in the other European provinces of Turkey. Of this 8,500,000 he calculates that 4,750,000 are Christians, rather over 3,500,000 Mahometans, and 75,000 Jews.

A FINE ART AND INDUSTRIAL EXHIBITION FOR YORKSHIRE.

THE foundation stone of a permanent building, to be called the Yorkshire Fine Art and Industrial Exhibition, was laid at York on the 22nd ult. The site secured belonged to her Majesty's Commissioners of Woods and Forests, and has been obtained from the Crown on a lease of 999 years for 4,000*l*., and the entire cost of the building, &c., will be about 20,000*l*. The structure will have a frontage of 104 ft., and will be set back on the site, so as to provide an open space in front of 200 ft. by 120 ft. In front the building will be two stories high, and one story at the back. The main front will have an open arcaded portico of five arches, with an arcade at each angle, covering a surface of 54 ft. by 13 ft. The entrance will be by three central doorways, 7 ft. wide each, and also by a doorway upon each side of the portico. These will open into an entrance-hall, 39 ft. by 27 ft., with secretaries' and committees' rooms, lavatories, &c. This hall will lead directly by three arches into a central lecture or concert hall, 87 ft. by 39 ft. and 50 ft. in height, having a curved and open timber roof, which will be decorated. On each side of this hall will be apartments for pictures, lighted from the top, and forming two continuous galleries,—that nearest to the Palace of James I., now used as a school for the blind, measuring 102 ft. by 29 ft.; and the other, on the Bootham side, 85 ft. by 29 ft., both having a height of 26 ft. On the front portion of the structure there will be a permanent picture-saloon, 100 ft. by 29 ft. and 26 ft. high, furnished with fireproof floor, and lighted by double skylights. This will be approached by a wide staircase. The material used for the building will be, in the front portion entirely of stone, whilst the sides will be erected with white brick and stone dressings. The main front will have ornamentations of statuary and mosaic work. It is expected that the Exhibition will be opened in the autumn of next year. Mr. E. Taylor is the architect.

ARCHITECTS' CERTIFICATES.

LUDBROOK *v.* BARRETT.

THE plaintiff in this action, tried in the Common Pleas Division, before Mr. Justice Manisty and a special jury, was a painter and decorator, of Norris-street, Haymarket, and the defendant an architect and surveyor, carrying on business at Dowgate-hill, in the City.

Mr. Woodard, instructed by Mr. G. E. Carpenter, appeared for the plaintiff; Mr. Edward Clarke and Mr. Gill, instructed by Messrs. Wontner & Son, for the defendant.

This case is important to architects and builders, as it decides that an architect may, under certain circumstances, be liable to a builder for the amount due to him from a building owner. In the year 1875 the plaintiff agreed to do certain repairs at No. 30, St. Martin's-lane, for a Colonel Ridgway, the lessee of the premises, according to a specification prepared by Mr. Joseph Waghorn, of Craven-street, Strand, who was the architect and surveyor to the ground landlords. It was part of the contract that the work should be done to the satisfaction of both Mr. Waghorn and the defendant Barrett, Col. Ridgway's architect. The plaintiff, as the works progressed, received from Col. Ridgway moneys on account. After the work was done, the plaintiff was unable to obtain payment of the balance due under the contract from Col. Ridgway, and therefore attempted to recover it in an action. The action was referred to a Master, and, though the plaintiff succeeded in obtaining an award from the Master for so much of his claim as related to extra work, and which was not included under the contract, he was unsuccessful for so much of his claim as consisted of the balance of the contract, owing to Mr. Barrett refusing to signify his satisfaction.

This action was now brought to recover damages from the defendant as Col. Ridgway's architect; and it was alleged on the part of the plaintiff that he had executed the work in accordance with the specification above mentioned in a good, sound, and workmanlike manner, and that all things necessary had been done by the plaintiff to entitle him to have from the defendant an intimation of his satisfaction.

Mr. Waghorn gave evidence as to his being satisfied; and the plaintiff and his solicitor also spoke to the defendant's having admitted to them that he was satisfied with the work, but that when he was asked to declare his satisfaction, he refused to do so.

The Judge left it to the jury to say whether they thought the defendant really was satisfied with the work, but pretended that he was not so satisfied. If he was, the plaintiff was entitled to a verdict; if, on the other hand, they thought that the defendant never was satisfied with the work, and was acting in good faith, then their finding must be for the defendant.

The jury found a verdict for the plaintiff for damages equal to the balance of the contract.

A SURVEYOR'S ACTION SUSTAINED.

KEELING *v.* LAKE.

THIS was an action tried in the Bloomsbury County Court, before Mr. Judge Russell, in which the plaintiff, an architect and surveyor, carrying on business at 22, Basinghall-street, sued the defendant, described as a promoter of public companies, residing in Great Russell-street, Bloomsbury, to recover the sum of seven guineas for professional services rendered to the defendant in surveying, plotting, and making plans of some proposed bank buildings in Great Russell-street.

It appeared from the plaintiff's statement that he took out the summons in the joint names of himself and his former partner, a Mr. Blackburn, who was in connexion with him at the time of the transaction, but since then the partnership had been dissolved. The plaintiff said the instructions for the work done had been given to his former partner, but he had personally seen the defendant, who was satisfied with the work, the account for which not having been paid, the present action was brought. After the plaintiff had stated his case at some length,

The Judge asked how he proposed to render the defendant liable.

The plaintiff replied, by the letters he should produce in Court, which, being put in, concluded the plaintiff's case.

The defendant being called, said that the arrangement come to with the defendant's partner was that the firm should accept the surveyorship of the Proposed Banking Company, and that the order given was only preliminary to that arrangement being carried out. Moreover, the arrangement was entered into entirely with Mr. Blackburn, and not with the present plaintiff.

His Honour.—But he has sued in their joint names, and therefore that objection cannot stand.

The plaintiff re-called, said, in reply to the Judge, that such a proposition had been mooted; and had they been able to ascertain who the directors of the proposed company were, they would have entertained the proposition; but not being able to ascertain this, they did not wish to give their names to an undertaking about which they knew nothing.

At this stage of the case, the Judge said he was clearly of opinion that the plaintiff was entitled to recover, as even the letters produced by the plaintiff, written by the defendant, had clearly put the latter out of court.

Judgment was accordingly entered for the plaintiff for the full amount claimed, with costs.

KILLED IN AN EXCAVATION.

ON Saturday last, Dr. Diplock, coroner for West Middlesex, held two inquests at Brentford, on the bodies of George Pizzey and Thomas Edmunds, two labourers, who had been employed under Mr. W. J. Ball on some houses being erected at Brentford Butts, for Mr. James Bignell, of Stile Hall, Kew Bridge-road.

John Powell, another labourer employed on the works, deposed that Edmunds, who was "his mate," took the job, and witness was going with him to sign an agreement after being paid on the Saturday. An excavation had been made for a drain, 200 ft. in length, and 10 ft. deep, being about 3 ft. wide at the top, and there was about 20 ft. more to do. They had begun to put struts in, and while at dinner about two barrow-loads of loose earth fell. Immediately after dinner, about two tons of earth "like a slice of the side" fell in upon the deceased men. The other men were working with their backs to them, and they did not at first know of the accident, but as soon as they did the two men were dug out, when one was found to be already dead and the other expired while the doctor was examining him.

In reply to the jury, witness said one cross strut had been put in at the bottom, and they had begun to put in another at the top, when the accident happened. He did not employ Pizzey, Edmunds did.

Mr. W. J. Ball, builder, of the Upper Butts, New Brentford, was examined, and said he was foreman over the building works at the Butts, and they started opening

a drain on Monday. He superintended the laying in of the pipes. He saw the work on Thursday morning, and there did not appear to be any alteration. He told Edmunds, to whom he gave the job, to let him know if there was any alteration in the earth, and to use struts; and he said he would take care not to risk his life.

In reply to a juror, witness said the greater part of the earth was gravel, and he considered it did not require strutting, but the loose earth did. He let the job to Edmunds, who was a sober, steady man. Neither he nor witness had had any experience in ground works, but in building operations generally, and Edmunds had carried out several jobs satisfactorily in the New-road, Brentford. Edmunds was to have signed the paper witness drew up on the Saturday. Powell was brought in by Edmunds. Since the accident, Powell being the contractor, witness had got him to strut the excavation throughout, to prevent any further accident.

The jury remarked that, for men working at such a depth from the surface as 10 ft., there ought to have been better protection in the way of timber supports to the sides of the excavation.

The jury returned a verdict of "Accidental death."

VACANT DISTRICT SURVEYORSHIPS.

At the meeting of the Metropolitan Board of Works, on the 10th inst., the Building Act Committee submitted a report, recommending that the district of St. Pancras, vacant by the death of Mr. H. Baker, late district surveyor, be divided into three districts of approximately equal value, and that the Board do fix a day for the election of three district surveyors for the respective districts.

Mr. Furniss proposed the adoption of the report, and said it was thought that each of these three districts, if properly managed, would yield an income of between 400*l.* and 500*l.* a year.

Mr. Freeman considered that in this matter the Board was pursuing altogether a wrong course. He held that it was detrimental to the public service that district surveyors should be allowed to have private practice. They ought to have good districts, yielding not less than 800*l.* or 900*l.* a year each, and gentleman should only be appointed on the express condition that they devoted the whole of their time to the performance of their duties as district surveyors.

Mr. Selway said he entirely shared the view urged by Mr. Freeman, and in the committee he moved a resolution to that effect, but was defeated. He was of opinion that the time had come when district surveyors should be in more direct communication with the Board, and should give the whole of their time to the performance of their duties as public servants. He thought the committee made a mistake in dividing this district into three parts, and that a division into two would be preferable.

Mr. Le Breton did not consider that the time had come when they should revolutionise the whole system, and believed that in the past the duties of district surveyor had been very well performed.

After some remarks from Mr. Dresser-Rogers, who believed that in calling upon district surveyors to relinquish their private practice, a practical difficulty would arise in regard to the varying amounts yielded in the shape of fees by the different districts,

Mr. Fowler advocated a system of promotion in regard to the district surveyors, so that a man who had proved himself a careful, able, and trustworthy servant, should be promoted to a district which produced a larger income. If the suggestion of Mr. Freeman were adopted, he was afraid that they would get a very different class of men to offer themselves for appointment.

Mr. J. E. Saunders strongly supported the motion for the adoption of the recommendation of the committee, and expressed his conviction that, on the whole, the work of the district surveyor was not badly done.

The motion was then put and carried *nem. con.*, and on the suggestion of Mr. Furniss, that day month was fixed for the election.

Another report of the Building Act Committee was read, recommending, with reference to the letter from Mr. J. H. Good, tendering his resignation as district surveyor for the district of St. Mary, Stratford-le-Bow, and All Saints, Poplar, that the resignation be accepted; and that Mr. Chester Foulsham, district surveyor of St. Leonard, Bromley, be appointed interim surveyor of the vacant district.

Mr. Furniss, in moving the adoption of the report, stated that the committee had under consideration the question of the expediency of dividing such district, and would report to the Board thereon after the next meeting of the committee.

BRICK KILNS.

Sir,—In your number for April 6th, you gave an account of Fosters' new brick-kiln at work at Normanton. I wish to inform you that my continuous drying and burning brick-kiln was invented and patented a year and a half before that of Messrs. Foster; and as they use a system similar in many details to my own patent, I wish to call attention to the fact, lest persons adopting the kiln in question should inadvertently become liable for infringement of my patent right. My system, however, in addition dries the bricks by induced currents of fresh air, before submitting them to any heat. Many inventors have tried the same system as Messrs. Foster, but have always failed, because the principle of my invention has invariably been lost sight of.

Thomas Whitwell.

Surveyorship, Christ's Hospital.—Out of the thirty-one candidates who offered themselves, the Committee of Almoners, on the 7th inst., selected four, viz., Messrs. F. Chambers, H. S. Legg, T. Roger Smith, and W. Tasker. These names were submitted to the court of Governors on the 15th inst., H.R.H. the Duke of Cambridge in the chair, when Mr. Legg was elected. The votes recorded were: Legg, 53; Chambers, 41; T. Roger Smith, 16; and W. Tasker, 16.

TAKING CASTS.

Sir,—In the *Builder* of May 4th I see a letter, signed "F.R.I.B.A.," on the proposed memorial to the late Sir G. G. Scott, and therein he says:—"All reproductions have been forbidden at Southwell Minster since the damage was done to the beautiful carvings at the entrance to the chapter-house in making the casts for the Crystal Palace." That is an error. No damage was done, or complaint made at that time, for my father had the contract to supply the casts from both Southwell Minster and Lincoln Cathedral to the Crystal Palace. On a subsequent occasion a workman, an Italian, by the way, whom he sent there, left the parts he operated on in such a disgracefully-dirty state that permission to take casts there was stopped. In 1860, after his death, through Sir G. Scott, the greater part of his stock of casts were purchased for the Museum, and amongst them were some fine specimens from Southwell Minster.

J. C.

CHURCH-BUILDING NEWS.

Chelmsford. — The chancel of Chelmsford Parish Church was reopened for use on the 14th ult., after being closed for nearly a year during restoration, the cost of which has been borne by the rector, the Ven. Archdeacon Mildmay. The chancel, before restoration, was low, and, owing to the absence of any clear-story, not well lighted. A range of clearstory windows has been built over the old arches, which have been carefully preserved intact, and an open timber roof of simple character has replaced the old plaster ceiling. The east window has been enlarged from three to five lights, still retaining its original character, and the stained glass has been re-arranged by Messrs. Clayton & Bell. An enriched string-course runs along the east wall under the window, but there is no reredos, as a movable triptych is to be placed on the retable. This is now in preparation, the panels being painted by Miss Mildmay, and the carving being executed by Miss Evelyn Mildmay, by whom the side-screens for the sanctuary will also be carved. The whole of the chancel roof is decorated with colour and gilding, by Messrs. Heaton, Butler, & Bayne, under the direction of the architect. New gas-fittings, by Messrs. Hart, Son, & Peard, have replaced the old standards, and a pavement in tile mosaic has been laid in the sanctuary by Messrs. Simpson. Mr. Parmenter, of Braintree, was the builder, and Mr. A. W. Blomfield was the architect employed.

Havering.—The new church of St. John the Evangelist, Havering, near Romford, was consecrated by the Bishop of St. Albans on the 13th ult. The old church, which was demolished to make room for the new one, is stated to have possessed little archæological interest. It was a one-span church, in the style of the latest period of Gothic, but executed for the most part at a much later period, probably in the seventeenth century. The walls were of brick, and the mullions and tracery of cement. The new church has been built as far as possible on the lines of the old, but is considerably larger in plan. It consists of a nave and one side aisle, a chancel, and a chancel aisle, which forms the organ-chamber and vestry. The material of which it is built is internally brick, used merely in the place of rubble, and nowhere exposed to view. It is plastered internally, and externally is faced with split flint. The dressed work is throughout of Box Ground Bath stone. The tower is placed towards the south-west angle of the church, and the lowest stage forms the porch. The doorways are richly moulded. The tower itself is square, and has a circular staircase forming an angle turret. The nave is divided into three bays of wide-spanned arches. It is lighted by a large traceried window in the west end, and by two traceried windows in the south wall. There is a range of small windows to light the north aisle. The chancel has an east and three south traceried windows. The roof of the nave is a tie-beam roof of simple construction, boarded and divided into panels. The roof of the chancel is a plain arched roof similarly divided into panels, but is ornamented by carved bosses at the intersections of the ribs. Beneath the easternmost window of the chancel are three sedilia with carved canopied heads. The church is warmed by a hot-water apparatus by Mr. D. O. Boyd, of Maddox-street, Regent-street. The style of architecture adopted is that of the latter part of the fourteenth century. Mr. Basil Champneys is the architect, and Mr. J. S. Hammond has carried out the work, the cost of which has been nearly 5,000*l.*

Speenhamland.—The work of erecting a new chancel to St. Mary's Church, Speenhamland, near Newbury, is about to be commenced. The estimated cost of the works is about 3,000*l.* It is not at present contemplated to remove the old-fashioned galleries, although this matter will receive further consideration as the work proceeds, but another organ is to take the place of the one now in use. The work will be carried out from plans by Mr. Street, R.A.

VARIORUM.

"L'Art," which week by week fulfils the promises of its earlier life, has commenced an account of the buildings for the Paris Exhibition, by M. Eug. Viollet-le-Duc. An etched view of the Palace of Trocadéro is given. The same number contains an interesting illustrated account of the Mont Saint-Michel. In the current number views of the building on the Champ de Mars appear.——No. 1 of Cassell's cheap *Magazine of Art* gives good promise. The editor says, "In the *Magazine of Art* the theme of art will be enlarged upon by presenting conceptions of a higher order, carried out by more subtle skill: art, which provides, not merely what is agreeable to eat, soft for wear, or convenient for daily uses, but recreation and enjoyment, as well as culture for the mind. These conceptions, clothed by art, are properly called fine arts; and it is with a view to providing the largest number of persons possible with the means of participating in the incomparable advantages and pleasures which art can confer, that the *Magazine of Art* has been projected."——Cook's "Guide to Paris and its Exhibition, 1878," is so mere a skeleton that we fail to recognise its use. Messrs. Cook should have made it fuller while they were about it. ——"A Handbook for Public Meetings, and as to the Duties of Chairmen, &c.," by G. F. Chambers, Barrister-at-Law (Stevens & Sons), is exactly what its title indicates, and, moreover, includes a valuable digest of reported cases relating to meetings.——Messrs. Cassell, Petter, & Galpin have commenced, in monthly parts, a popular serial work on science, under the title of "Science for All," edited by Robert Brown, M.A., and illustrated with engravings and diagrams. What is proposed in "Science for All" is to take the every-day incidents of life and the commonest objects which surround us, and show, in simple and clear language, the scientific principles which underlie them, and whose operation they illustrate. "The flame of a candle will serve as a text on which to treat of combustion,—from a dead leaf picked up in the woods can be taught the principles of vegetable construction, and life, and growth; by the markings in the marble which ornaments our chimney-piece can be elucidated the geological formation from which it has been dug, and the varied processes by which it and kindred formations have been produced."

Sacrarium Pavement, Norwich Cathedral.—There has just been brought to a close a portion of the internal restoration at Norwich Cathedral, to which the Dean, Dr. Goulburn, has given very special attention. This work is the sacrarium pavement. A broad band of steel-coloured Belgian marble follows the line of the apse, and extends one bay westward of the semi-circle within this, and about 4 ft. distant is another marble band following the same line. The space between the two bands is filled with mosaic paving of a guilloche or interlaced pattern of black and gray, with a border of a dancette pattern, claret and gray; between these and the marble runs a pattern of iridescent green. The space immediately in front of the altar is covered with a large and intricate geometrical pattern, enriched by a variety of coloured marble, and this is continued at the back or east of the altar, the border in this case being the vine forming a rich scroll pattern. At the chord of the apse a larger daïs or footpace is raised, formed by solid marble steps, and on this, between two borders of black and blue, runs a most beautiful pattern of the vine-branch in natural colours. The altar-table, which is of large dimensions, stands on the centre of this platform. The work was designed by Mr. A. W. Blomfield, architect.

Miscellanea.

Rood Screens in Christ Church, Dublin. At the General Synod of the Church of Ireland there was a protracted discussion as to the erection of a rood-screen, surmounted by a cross, in Christ Church Cathedral. Mr. J. C. Bloomfield moved the adoption of a canon making the erection of screens, shrines, &c., illegal in the church, as leading to idolatry or superstitious uses. He said they were all thankful to Mr. Rowe for his magnificent liberality in restoring the old cathedral, but really if things remained as they were—if rood-screens were permitted—there would inevitably be a schism in the Church. What with these erections and the painted windows—two representing the Saviour on the cross, and the third the Queen of Heaven with the Church in one hand and a lily in the other—they might easily conceive a Roman Catholic onlooker saying of the cathedral, "Dear me; is it ours already?" Archdeacon Reichel moved the previous question. Mr. James Spaight, in seconding the propositon to shelve the question, regretted that there had been censorious criticism instead of universal gratitude for the gift, he might say, of one of the noblest ecclesiastical edifices in the United Kingdom. If they were about to build a cathedral or a church, the objection to screens would be another thing. The Bishop of Cashel supported the original resolution, submitting that it would be an insulting delicacy to suppose that Mr. Rowe would feel offended by the removal of what was a stumbling-block to many. The previous question was put, and the voting was:—Clergy—ayes, 46; noes, 127. Laity—ayes, 108; noes, 64. There not being a majority of each order in favour of putting Mr. Bloomfield's resolution, it was lost.

Stanford's Patent Joint.—This joint is made by casting on the spigot and in the socket of the pipe, by means of accurately turned iron moulds, a durable material, which, immediately setting on the pipe, clings to it, and forms accurate rings mechanically fitting one another, like the spigot and socket of turned and bored cast-iron pipes. The rigidity of the iron pipe joint is avoided by giving the moulds a spherical form, the result being practically a turned and bored, spherical, or ball-and-socket joint, allowing considerable movement without rupture. To the practical man, aware of the difficulty and frequent impossibility of obtaining water-tight joints in deep cuttings, running sand, or other water-bearing strata, the advantages of a mechanically-fitting joint must be obvious. By its use the ordinary labourer will succeed in making sound work in ground where the most skilful workman might fail upon the old principle. The pipe-layer requires no tools, and no clay, cement, or other jointing material. He has merely to place the spigot of the pipe truly and fairly in the socket of the pipe previously laid and to drive it home. The joint is then perfect, and, owing to its spherical form, will remain so, there seems reason to believe, even after considerable settlement of the ground. During the last four years upwards of fifty miles of pipes with these joints have been laid, mostly in very bad ground, with satisfactory results. Messrs. H. Doulton & Co., of Lambeth, St. Helen's, and Rowley Regis, are the agents of the patentee for this country.

Level Crossings.—A meeting of the Court of Common Council has been held at the Guildhall, the Lord Mayor in the chair. Deputy Jones presented a petition from the inhabitants of the Ward of Bishopsgate praying the Court to take immediate steps to obtain the rejection of the clauses of the London and North-Western Railway (Additional Powers) Bill, now before Parliament, which refer to the permission sought to be obtained to lay down level crossings in Primrose-street and Skinner-street. These level crossings, he urged, would be a source of the utmost danger and inconvenience to the inhabitants, and he proposed the reference of the petition to the Local Government and Taxation Committee to oppose the clauses. Alderman William Lawrence seconded the motion. Mr. Rooke said that although these streets led to nowhere yet, the Metropolitan Board of Works had decided to construct a street in the vicinity, at a cost of 70,000*l.* or 80,000*l.*, which, if the level crossings were permitted, would be practically useless. The Court unanimously referred the petition with instructions to act as proposed. It is almost past belief that an attempt should be made to introduce a source of such danger in the City. Parliament would be guilty of neglect of duty if it gave the power asked for.

Exhibition of Art Treasures, Manchester.—Under the direction of Mr. Alfred Darbyshire, architect, Messrs. R. Neill & Sons have added very considerably to the floor-space at the Royal Institution, Manchester, available for use at the Art Exhibition, opened on the 16th inst., in aid of the building fund of the School of Art. The entrance-hall has been floored, and a space of about 40 ft. by 30 ft. is gained for glazed cases of art objects, and the walls will be covered with oil-paintings, tapestries, &c. The extensive loan collection of ancient and modern pictures comprise, specimens of Millais, Turner, Leighton, W. Müller, William Etty, F. Goodall, E. J. Poynter, Gainsborough, Legros, David Cox, the two Leslies, Andrea del Sarto, Henrietta Brown, A. Yvon, R. Ansdell, Elmore, Constable, Frost, J. Philip, T. Faed, and other artists of eminence. One of the rooms contains a selection of art objects from South Kensington Museum. The art workmanship includes enamelling, Japanese, Chinese, French, &c.; inlaid metal work, damascene niello, chased repoussé, &c., in gold and silver; Persian ware of singular beauty and rarity; ivory carvings in great variety; Chinese, French, and English porcelain and pottery, embroidery and other needlework, &c.

The Company of Fanmakers' Competitive Exhibition.—This Exhibition will be held in June, in a hall of one of the City livery companies, and will comprise the following classes:—1. Ancient European Fans. 2. Modern European Fans. 3. Exotic Fans. 4. Modern Fans of British manufacture. 5. Fans not comprised in the above classes. These classes will be subdivided into sections according to the leaves and sticks of the fans (if deemed necessary). Manufacturers, amateurs, collectors, and dealers are invited to contribute to the exhibition, designs or specimens of fan-leaves, painted or embroidered on silk, satin, cloth, or any other material, and of fan-leaves made of lace of various sorts, and fan-leaves to be exhibited either mounted or unmounted. The fourth class will form the object of special attention, the chief aim of this company being to revive the manufacture of fans in England. The prizes will consist of gold, silver, and bronze medals, struck with a special die bearing the arms of the Fanmakers' Company, and a suitable inscription; the freedom of the company, and an engraved diploma, signed by the master and wardens of the company. Mr. James Curtis, Old Jewry Chambers, is the honorary secretary to the Exhibition Committee.

New Church at East Acton.—Mr. F. J. Bramwell, F.R.S., the prime warden of the Goldsmiths' Company, on the 11th inst. laid the foundation of a new church at East Acton, which is about to be erected and endowed by the Company on its estate there. The church is to cost 14,000*l.*, and will be dedicated to St. Dunstan. At a luncheon which followed, the Bishop of London stated that this was the eighth church provided by City Companies since his occupation of the Metropolitan See.

End of the Manchester Joiners' Strike.—The strike of joiners in Manchester, which began on the 1st of May last year, has ended in the submission of the workmen. They have agreed to return to work at 8½d. per hour, the wages they had previously to the strike.

TENDERS

For the erection of an infectious hospital for the Guardians of Brentford Union, Isleworth. Mr. Edward Monson, jun., architect:—

Prout	£1,591 0 0
Beauchamp	1,450 0 0
Lambert	1,325 0 0
Baker	1,298 0 0
Linfield (accepted)	1,258 0 0

For first portion of alterations to the Earl of Zetland public house, Prince's-road, Notting-hill. Mr. Edward Monson, jun., architect:—

Colley	£315 0 0
Chapman	306 18 0
Linfield	292 0 0
Riches	291 10 0
Mitchell & Co.	279 0 0
Beach Bros.	268 0 0
Jackson & Todd	255 0 0
Banbury & Stevens	247 0 0
Vincent	235 0 0
Cox (accepted)	213 8 0

For the erection of four shops in Starch-green-road, for Mr. O. Davies. Mr. Edward Monson, jun., architect:—

Beach Bros. (accepted)	£2,155 0 0

For the erection of a villa residence in Goldsmith's-avenue, Acton, for Mr. J. Reeves. Mr. Edward Monson, jun., architect:—

Hunt (accepted)	£1,100 0 0

For alterations to the City of Salisbury tavern, Rodney-road, Walworth, for Mr. Carnell. Messrs. Ashby & Green architects:—

T. Brown	£930 0 0!
Stamp & Bowtle	910 0 0
G. & S. Fisher	895 0 0
Jackson & Todd	764 15 0
Bolam*	498 14 0!
Pewtering.	
Warne	153 0 0
Grimes	129 10 0
Browning (accepted)	123 0 0
Gas-fitting.	
Dunn & Sons	158 10 0
Dodson (accepted)	105 0 0
Plate Glass, Writing, and Embossing.	
Hollyer	168 0 0

* Accepted contrary to the architects' advice.!

For cleansing, whitening, and colouring the whole of the interior of the Highgate Asylum, offices, and chapel, for the Managers of the Central London Sick Asylum District:—

Crouch	£477 0 0
Nicholls	447 0 0
Ball	440 0 0
Bangs	420 0 0
Britten	356 10 0
Robertson	295 0 0
Holmes (accepted)	286 0 0

For external repairs, painting, &c., the Licensed Victuallers' Asylum, Old Kent-road, consisting of 176 houses, chapel, chaplain's residence, court-room, board-room, library, lodges, &c. Mr. W. F. Potter, architect:—

Butler	£964 0 0!
Hersee	850 0 0
Andrews	613 0 0
Pritchard	410 0 0
Hayworth (accepted)	395 0 0!

For alterations, additions, and repairs, to the Eagle Tavern, Camden-road. Messrs. Bird & Walters, architects. Quantities supplied:—

McLachlan & Sons	£1,928 0 0
Anley	1,797 0 0
Nightingale	1,750 0 0
Hockly	1,730 0 0
Lawrance	1,720 0 0
Temple & Foster	1,705 0 0
Williams & Son	1,683 0 0
Mark (accepted)	1,657 0 0

For stabling, cart-shed, &c., at New Barnet, for Mr. Wood. Quantities supplied. Mr. Joseph White, surveyor:—

Steel Bros.	£545 0 0
Prout	449 0 0
Grover	447 0 0
Butcher	437 0 0

For a new cottage and proposed alterations to a laundry, Strafford-road, Acton, for Mrs. Elizabeth Yates. Mr. E. Monson, architect:—

Waters	£340 0 0
Niblet	332 0 0
Nye	296 0 0
Bing	737 0 0
Penoney	700 0 0
Johnson	698 0 0
Linfield	685 0 0
Baker	679 0 0

For a villa residence, Guildown, for Mr. Paine. Messrs. Sparkes & Neville, architects. Quantities by Mr. Henry Moon:—

Putney & Sons	£1,265 0 0
Colls & Sons	1,195 0 0
Pink	1,163 0 0
Beale (too late)	1,123 10 0
Goddard & Sons	1,119 0 0

For new schools and residence, Tetsworth, Oxon. Mr. Arthur Vernon, architect. Quantities supplied:—

Fincher	£1,700 0 0
Honnor	1,697 0 0
Holland & Wells	1,690 0 0
Cooper	1,662 0 0
Hunt	1,615 0 0
Loosley	1,600 0 0
Silver & Sons	1,560 0 0
Woodbridge	1,547 0 0
Coles	1,544 0 0
Taylor & Grist	1,489 10 0
Holland & Son (accepted)	1,440 0 0
Groom	1,369 0 0

For Primitive Methodist school chapel, Colney Hatch. Mr. A. J. Rouse, architect:—

Heather & Davies	£1,244 19 0
Uff	1,075 0 0
Williams	1,050 0 0
Chapman	950 0 0
Crabb	925 0 0
Twelvetrees	897 0 0
Webber	885 0 0
Shurmur	873 0 0
Linfield	855 0 0
Freeman	845 0 0
Hobern	825 0 0
Matlock Bros.	797 0 0
Gibson & Guthrie	780 0 0
Vincent	775 0 0
Parker & Evans	764 0 0

For the erection of house and stabling, &c., at Sutton, for Mr. C. Bland. Mr. H. Jones, architect. Quantities by Mr. W. G. Ivett:—

Simpkins	£3,580 0 0
Turner	3,510 0 0
Drake & Co.	3,486 0 0
Bird & Son	3,395 0 0
Anwell	3,350 0 0
Holland	3,310 0 0

For the erection of a villa residence at Child's-hill, Hampstead, for Mr. Peter W. May. Mr. R. Adolphus Came, architect. Quantities supplied:—

Harper	£3,870 0 0
Morter	3,700 0 0
Browne & Robinson	3,633 0 0
Langmead & Way	3,573 0 0
Phillipson & Sons	3,349 0 0
Nightingale	3,292 0 0
Dando	3,097 0 0

For the erection of board-room, offices, public mortuary, &c., on land situate at the corner of Liquorpond-street and Gray's-inn-road, for the Board of Works for the Holborn District. Messrs. Isaacs & Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

Webster	£31,999	0	0
Patman & Fotheringham	29,500	0	0
Lucas Bros.	29,200	0	0
Brass	27,997	0	0
Kirk & Randall	27,940	0	0
Conder	27,868	0	0
Macey & Sons	26,672	0	0
Killby	26,326	0	0
Scrivener & Co.	26,210	0	0
Browne & Robinson (accepted)	25,987	0	0

For the restoration of St. Mary's Church, Ilchester. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. Deane:—

Bladwell	£4,896	0	0

For the restoration of the parish church, Radstock. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane:—

Long	£3,137	0	0
Mann	2,933	0	0
Bird	2,932	0	0
Bladwell	2,899	0	0
Hatherly	2,689	9	0
Brown	2,657	0	0
Jones	2,640	0	0
Davis	2,570	0	0
Wall & Hook (accepted)	2,519	0	0

For Manor Farm, Thickwood, for Mr. R. Walmesly. Messrs. Wilson, Willcox, & Wilson, architects:—

Bladwell (accepted)	£1,500	0	0

For Colerne schools, Wilts. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. Deane:—

Bladwell (accepted)	£2,290	0	0

For music hall, Wellclose-square. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane:—

Clements	£4,049	0	0
Bladwell	3,960	0	0
Cullum	3,798	0	0
Jones (accepted*)	3,282	0	0

* Also for the internal fittings, extra £1,017.

For St. John's Vicarage, Clapham, Surrey. Mr. A. C. Morton, architect. Quantities by Mr. Henry Smith:—

Niblett	£2,790	0	0
Tunell	2,692	0	0
Harris	2,580	0	0
Cox	2,469	0	0
Sawyer	2,449	0	0
Newton & Triggs	2,265	0	0
Julian & Co.	2,176	0	0
Mills	2,119	0	0
Beale	1,974	0	0
Howlett	1,768	0	0

For the erection of Board schools at Mount-pleasant, Coseley, for the Sedgley School Board. Mr. Archibald Paull Brevitt, architect. Quantities by the architect:—

Dawson & Bradney	£3,960	0	0
G. & F. Higham	3,926	0	0
Lovatt	3,913	0	0
Horsman & Co.	3,848	0	0
Gough	3,736	18	6
Nelson	3,705	0	0
Millward	3,500	0	0
Horton	3,489	0	0
Peacock	3,477	17	6
Stockton & Son	3,474	0	0
Jones & Sons	3,389	0	0
Guest	3,350	0	0

For the erection of Board schools at Lanesfield, for the Sedgley School Board. Mr. Archibald Paull Brevitt, architect. Quantities by the architect:—

Rowley & Lynex	£1,375	0	0
Nelson	1,310	0	0
G. & F. Higham	1,200	0	0
Exors. of Cresswell	1,200	0	0
Horsman & Co.	1,196	0	0
Peacock	1,165	14	0
Dawson & Bradney	1,150	0	0
Adams	1,150	0	0
Stockton & Son	1,099	0	0
Horton	1,087	0	0
Gough	1,084	0	0
Moore	1,065	0	0
Guest	1,032	0	0
Jones & Sons	995	0	0

For repairs to highways, Isle of Wight. Mr. E. Humphreys, surveyor:—

Jones	£4,125	0	0
Cotter	3,800	0	0
Cooper	3,500	0	0
Coker & Co. (accepted)	3,260	0	0
Hailock	2,998	0	0
Davis	2,300	0	0

For the erection of a Sunday school, in rear of the Wesleyan Chapel, Mildmay Park. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Chessum	£4,430	0	0
Tarrant	2,336	0	0
Woodward	2,258	0	0
Ball & Wickes	2,197	0	0
Hobson	2,190	0	0
Nightingale	2,181	0	0
Scrivener	2,157	0	0
Browne & Robinson	2,148	0	0

For proposed hotel, Kingston-on-Thames, for Mr. George Jackson. Mr. Silvester C. Capes, architect. Quantities by Mr. Alfred Boxall:—

Elder	£5,880	10	0
Alderton	5,840	0	0
Harmer	5,800	0	0
Jarvis	5,760	0	0
Scrivener & Co.	5,597	0	0
Messom	5,497	0	0
Mason	5,390	0	0
Nightingale	5,287	0	0
Wells	5,029	19	0

For the erection of three pairs of villas in the Underhill-road, East Dulwich, for Mr. Joseph Sarl. Messrs Hooper & Co., architects:—

Dover Bros. & Co. (accepted)	£3,480	0	0

For sundry artificers' works required to be done in the erection and completion of a factory with offices, engine and boiler houses, boundary walls, &c., in Trinity-street, Loughborough, for the Nottingham Manufacturing Company, Limited. Messrs. Evans & Jolley, architects:—

Needham	£11,567	0	0
Pattinson	11,479	0	0
Dennett & Co.	10,277	0	0
Richardson	10,498	0	0
Smith	9,695	10	0
Main	9,448	0	0
Moss	9,209	0	0
Hind	9,157	0	0
Vickers	9,137	0	0
Bradley & Barker	8,998	0	0
Wheatley & Co.	8,894	0	0
Till	8,874	0	0
Stevenson (accepted)	8,700	0	0

For the erection of a Branch Bank, for the London and South-Western Banking Company, at the corner of Small-street and Corn-street, Bristol. Mr. James Weir, architect. Quantities by Mr. C. G. Maylard:—

	Portland Stone.	Doulting Stone.	Bath Stone.
Eastabrook & Son	£25,600	£23,000	£22,300
Wilkins & Sons	25,400	22,800	22,000
Church	24,400	21,972	20,700
Veals	21,850	21,000	20,000
Kingstone	20,022	—	19,622
Hatherley	22,000	19,975	19,143
Davis	21,385	19,950	18,900
Baker	19,640	19,940	18,440
Crocker	18,919	18,450	18,119
Brock & Bruce	19,810	19,310	17,850
Stephens & Bastow	19,895	18,147	17,295
Howell*	19,500	17,400	17,150

* Accepted in Bath stone.

For pulling down and rebuilding No. 322, Bethnal-green-road, for Messrs. Winsbury. Mr. J. A. Needham, architect:—

Stamp & Bowtle	£1,172	0	0
Howard	1,124	0	0
Wire	1,085	0	0

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NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Erratum.—In Mr. Middleton's letter on "the work at St. Alban's" last week (p. 494, *ante*), the phrase, "greater *ratio* of struts," towards the end, should have been "greater *rake* of struts."

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